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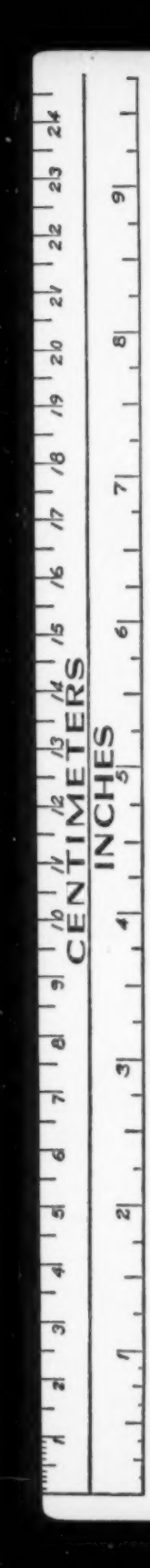

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AMERICAN ANTIQUITY

VOL. XX JANUARY, 1955 No. 3

WARE GROUPINGS AND DECORATIONS OF WOODLAND CERAMICS IN ILLINOIS

MELVIN L. FOWLER

THIS STUDY deals primarily with the pottery from a series of 8 Middle Woodland village sites in the central Illinois River valley (Mason, Tazewell, Fulton, Peoria, and Marshall counties in Illinois, see Fig. 62). Comment regarding 3 other sites is also included. All of these sites but one are either directly associated with Hopewellian burial mounds or have Hopewellian pottery and other artifacts scattered throughout the debris. There are numerous other sites known with material similar to these sites, but they are not included here due to the small number of sherds in each of these sites (for example, F°77, F'88, and others reported on by Cole and Deuel in 1937).

The purpose of this particular study is twofold. First of all an attempt is being made in this report to present indications of changes through time and style preferences in a rather well-known culture. It is hoped that these indications will help us to understand the temporal position of the different sites and to build up a body of information that will allow better understanding of the various cultural forms, in this particular case, pottery. Incidental to this is the presentation and testing of techniques of analysis for making such studies. The limitations and concepts under which this study is made are fully discussed below. The second purpose of this report is to present a body of data so that it is available for others. All of the data upon which the interpretations and conclusions are drawn are in the charts and tables in this report. I hope that it is presented so that it will be useful to others in whatever way they might want to utilize it.

Description of the sites. The site giving the most information is the Clear Lake site (T'1) located above the Illinois River on the borderline of Mason and Tazewell counties (Cole and Deuel 1937: 181-91; Fowler 1952). Excavations were made at this site at 3 different times: first, by the University of Chicago, then by Mr. and Mrs. George Schoenbeck of Peoria, and finally by the Illinois State Museum in the fall of 1950. All 3 of these excavations demonstrated 3 main soil strata. The basic underlying subsoil, Stratum I, was a uniform yellowish sand found at the bottom of all excavations. The only artifacts found in this stratum were in the topmost portions. Overlying this was Stratum II which was a uniform black sandy soil filled with cultural debris. Stratum III varied in different parts of the site, in some places only a shallow plowed zone and in others made up of several layers of light and dark sands. In the University of Chicago excavations Stratum II was at its thickest and could be divided into 2 substrata, IIa and IIb. In this analysis the Schoenbecks' and the Illinois State Museum's test trenches have been lumped together and treated as one unit due to their similarities (Fowler 1952 Pls. 42, 43), and the University of Chicago test pit has been treated separately.

The second site to be considered is the Whitnah Village site (F'49) located in Fulton County (Cole and Deuel 1937: 161). In the different trenches of the University of Chicago excavations from 7 to 9 6-inch layers were removed. Due to the small numbers of sherds found in each layer, the excavation has been divided into 3 units of 2 layers each for this study. This roughly corresponds to the natural soil strata in the site.

The Schoenbecks also collected a large number of potsherds and other surface materials from Clear Lake site and the Whitnah site. In collecting at the Whitnah site the Schoenbecks seem to have gotten their materials from a slightly different portion of the site than did the University of Chicago and their collections seem to indicate a slightly earlier occupation. For this reason the surface material from this site has been kept separate from the excavated materials and treated as a separate unit.

Nearby is another site that was excavated by the University of Chicago, the Hummel Campsite (F'574, Cole and Deuel 1937: 166-71). One of the test pits dug at this site was excavated in 4 6-inch layers. In using this material for our analysis, we have combined the layers into groups of 2 each.

Near the well-known Dickson Mounds State Park in Fulton County is a small Woodland campsite (F'35). In the excavations made by the University of Chicago (Cole and Deuel 1937: 126-32) only a small number of sherds were found, comparatively speaking. However, there were no Hopewell sherds found, and this site seemed to indicate a pre-Hopewell occupation, called by them, Central Basin. Because of the homogeneity of the materials and the paucity of potsherds, the excavation units were lumped together and materials from the surface to 2 feet, and 2 feet to 4 feet below the surface, were treated as analytical units.

Just on the outskirts of Havana, Illinois, is a large Hopewellian site which has been called the Havana site. A test pit was dug by an Illinois State Museum field party into the village area of this site, removing 4 8-inch layers (McGregor 1952). Following McGregor's suggestion, we have combined layers 1 and 2 into one layer and left 3 and 4 as separate units for our analysis.

Northeast of Peoria, in Peoria County, is another Hopewellian site, the Rench site (P'500), which has been previously reported (Schoenbeck 1949). The Schoenbecks collected a considerable amount of Hopewellian material here over a period of several years. This site is known from only these surface collections, which now belong to the Illinois State Museum. Corner-notched projectile points, flaked knives, zone-stamped pottery, and copper tools justify the analysis of this site as a manifestation of the Hopewellian culture. From the reports of the Schoenbecks and others regarding this site, it seems very probable that there is a deep cultural deposit there, and excavation would probably be very profitable. Near this site is the Steuben site (Ma'201) from which the Schoenbecks also collected material (Schoenbeck 1948). The material from this site is also now in the Illinois State Museum. Besides the typical Hopewellian pottery and other artifacts found there, the Schoenbecks discovered a very interesting sandstone head originally belonging to a figurine done in the Hopewellian art style.

In excavating the Dickison Mounds (P° 477 and 478) north of Peoria, Illinois, Walker recovered a quantity of potsherds. This pottery possibly came from an occupation predating the building of the burial mounds which were definitely Hopewellian. The pottery from the fill of these mounds is treated in this report as a surface (unstratified) collection (Walker 1952).

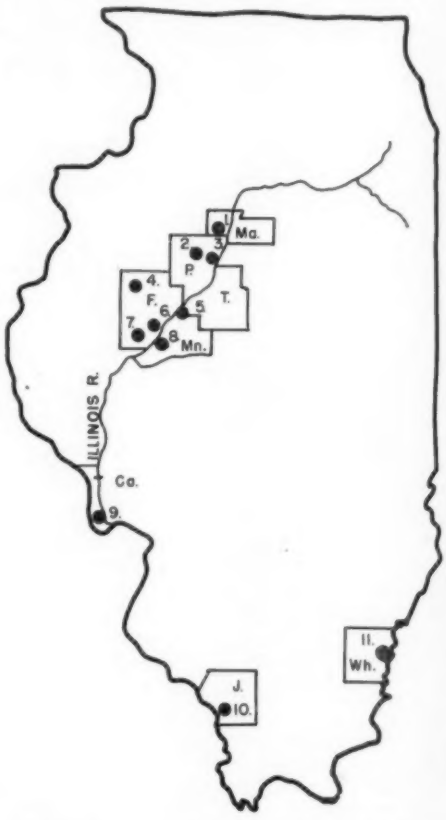

FIG. 62. Location of Illinois sites discussed in text. 1, Steuben site, Ma'1; 2, Rench site, P'500; 3, Dickison site, P°477-78; 4, Hummel site, F'574; 5, Clear Lake site, T'1; 6, Havana site, Mn'15; 7, Whitnah site (Sister Creek site), F'49; 8, Dickson Camp site, F'35; 9, Snyders site; 10, Twenhafel site, J'1; 11, Hubele site, Wh'30.

In analyzing the materials from these different sites, the surface collections are treated as one would treat a single excavation layer or stratum at one of the excavated sites; that is, they are treated as an analytical unit.

The Clear Lake site is numbered from the lowest stratum to the top. The other sites were numbered by the excavators from the top layer down to the lowest. It is unfortunate, perhaps, that there was not uniformity of method in numbering these layers, since this perhaps causes some little confusion in understanding the data in this paper. We have, however, retained the numbering of the excavators since it has appeared this way in print.

Definition of Terms. I derived the concepts discussed here from the work of Rouse (1939-1941), but have interpreted them to apply to the work I was doing rather than attempting a strict literal application of them as Rouse used them.

SITES and LAYERS	CANTON WARE	WEAVER WARE	HAVANA WARE	HOPEWELL WARE	LIVERPOOL WARE	TOTALS
T^{v}1 CLEAR LAKE ISM-S STRATUM III	11.4 9	81.0 64	7.6 6			79
F^{v}49 SISTER CREEKS 0-1 FOOT B.S.		85.4 100	11.9 14	2.7 3		117
T^{v}1 U of C STRATUM III	4.2 10	74.9 176	20.9 49	1.0 2		235
T^{v}1 ISM-S STRATUM II	0.3 3	75.3 604	22.3 182	1.0 7	1.0 8	802
T^{v}1 U of C STRATUM IIB	0.5 1	74.0 149	24.0 49	1.0 2	0.5 1	202
F^{v}49 1-2 FEET B.S.		71.8 113	24.2 38	4.0 6		157
F^{v}49 2-4 FEET B.S.		61.4 62	32.7 33	5.9 6		101
T^{v}1 SURFACE COLL.	6.6 1,589	57.0 13,783	33.7 8,117	1.2 305	1.3 311	24,105
T^{v}1 ISM-S STRATUM I		55.0 49	41.5 37	2.3 2	1.2 1	89
F^{v}49 SURFACE COLL.	0.2 2	39.9 489	55.8 684	3.2 39	0.5 6	1223
P^{v}500 RENCH SURFACE COLL.	1.2 12	38.4 381	57.4 571	2.7 27	1.5 15	990
T^{v}1 U of C STRATUM IIA		33.4 41	64.5 80	2.5 3		124
Mo^{v}201 STEUBEN SURFACE COLL.	0.6 12	25.3 506	66.5 1227	7.6 152		1997
Mn^{v}15 HAVANA SURFACE to 16" B.S.		16.5 104	79.4 500	4.1 26		630
Mn^{v}15 16"-24" B.S.		18.1 91	80.4 404	1.5 8		503
F^{v}574 HUMMEL 0-8" B.S.		8.7 12	84.7 117	1.1 1	6.6 9	138
Mn^{v}15 24"-32" B.S.		6.4 9	89.3 125	4.3 6		140
F^{v}574 8"-16" B.S.		2.2 2	95.6 94	2.2		98
F^{v}35 DICKSON CAMP 0-2" FEET B.S.			86.0 81		14.0 13	94
F^{v}35 2-4 FEET B.S.			80.9 89		18.1 21	110
P^{v}477 & 478 DICKISON MOUND FILL			15.7 47		84.3 252	299

FIG. 63. Proportions of ware groups from 8 middle Woodland sites in the central Illinois River Valley, shown graphically. In each box the number at the upper right is the number of sherds of the indicated ware, the number at the upper left the percentage of the total sherds from that excavation or surface unit. Excavated collections shown in black, surface collections vertically hatched; the column at the left shows relative position of the samples.

The basic term or concept used here is *feature*. It is simply the smallest recognizable single element that is observable in the pottery under study. Thus, tempering, stamping for decoration, a squared lip, etc., are all properly considered as features of the ceramics. More especially is the term used in this paper to refer to the smallest recognizable part of the decorative concepts utilized on the pottery under study. It is in this regard that the feature concept stands out most clearly.

The second concept is that of *mode*. In a sense, the concept of mode is an attempt by the archaeologist to understand the standards held by aboriginal potters in the making of the pots. A recognized feature may be an aberrant treatment by an individual or it may be a widespread and widely-utilized concept, in which latter case it is considered a mode. That is to say, if a feature is demonstrated to have cultural and historical significances rather than aberrant significance, it is considered as a mode. A mode also can be made up of a group of features that are found to be associated or linked together, such as tempering that is grit (one recognizable feature), but also is prepared in a specific way (another recognizable feature). The linkage of these 2 features demonstrates the mode for tempering. Modes can be established in several ways, one of which would be in demonstrating, through stratigraphic and areal data, that a feature has significance in time and/or space. Another would be through observation of features consistently appearing together.

In this study all of the observed decorative features can be safely considered as modes since they all seem to have cultural significance. The only case of aberrant material was 2 fingernail-impressed sherds in the Clear Lake site surface collection. These were not included in the analysis.

The next concept is that of *type*. Basically, my concept of a type is that it is a cultural phenomena which we are trying to understand and evaluate. A type, then, is a group of modes that are demonstrated to be significantly linked together in time and/or space; that is, they are culturally significant in their relationships. This relationship can be determined once the modes are established, largely by the association of modes that make up the whole vessel. If a group of modes are found on separate specimens on several different occasions, then a type of cultural significance is recognizable. With less assurance, if a group of modes having to do with the various portions of the entire pot can be shown to recur with the same frequencies in different sites or different levels of sites, a cultural type is suggested. For the most part, I feel that many of the types that are in the literature at the present time are actually features or modes, and demonstrating the distribution of such "types" is actually a demonstration of the distribution of the features or modes in question.

A *ware* is a grouping of pottery on a wider basis than a type grouping. A ware may include a group of types or even several series of types. This separation of pottery along broad lines has to do largely with the *general* paste characteristics, vessel form, and modes of decoration. A type may be limited arealy or temporally appearing at a single site or in a limited time period, whereas the ware usually has a broader cultural significance in time and space. By way of emphasis let it be stated again that the primary determinants of a ware are the *general* characteristics of *paste*, vessel *form*, and *decoration*.

Method of Analysis. First of all, there are very definite limitations to this study. It is my belief that for a study of pottery to be significant one must limit himself in the different phases of the work to analysis of limited categories. In other words, if in presenting data either in graph or tabular form one includes categories such as shape, paste, and decorative features all in one chart or table, then the true variations of any single group such as decorative features are not clear. This study was limited first of all to only Woodland pottery, even though in some sites Mississippi pottery was present in the upper levels. If one's goal was to demonstrate the relationships between Mississippi and Woodland pottery, then it should be included in the study. The second limitation of the study has been that it has considered only decorative features on the outside of vessel. The same type of study should be made of other ceramic features as well. When such studies are completed and the data from all synthesized, then there will be data that will make it possible to understand and recognize true culture types in pottery.

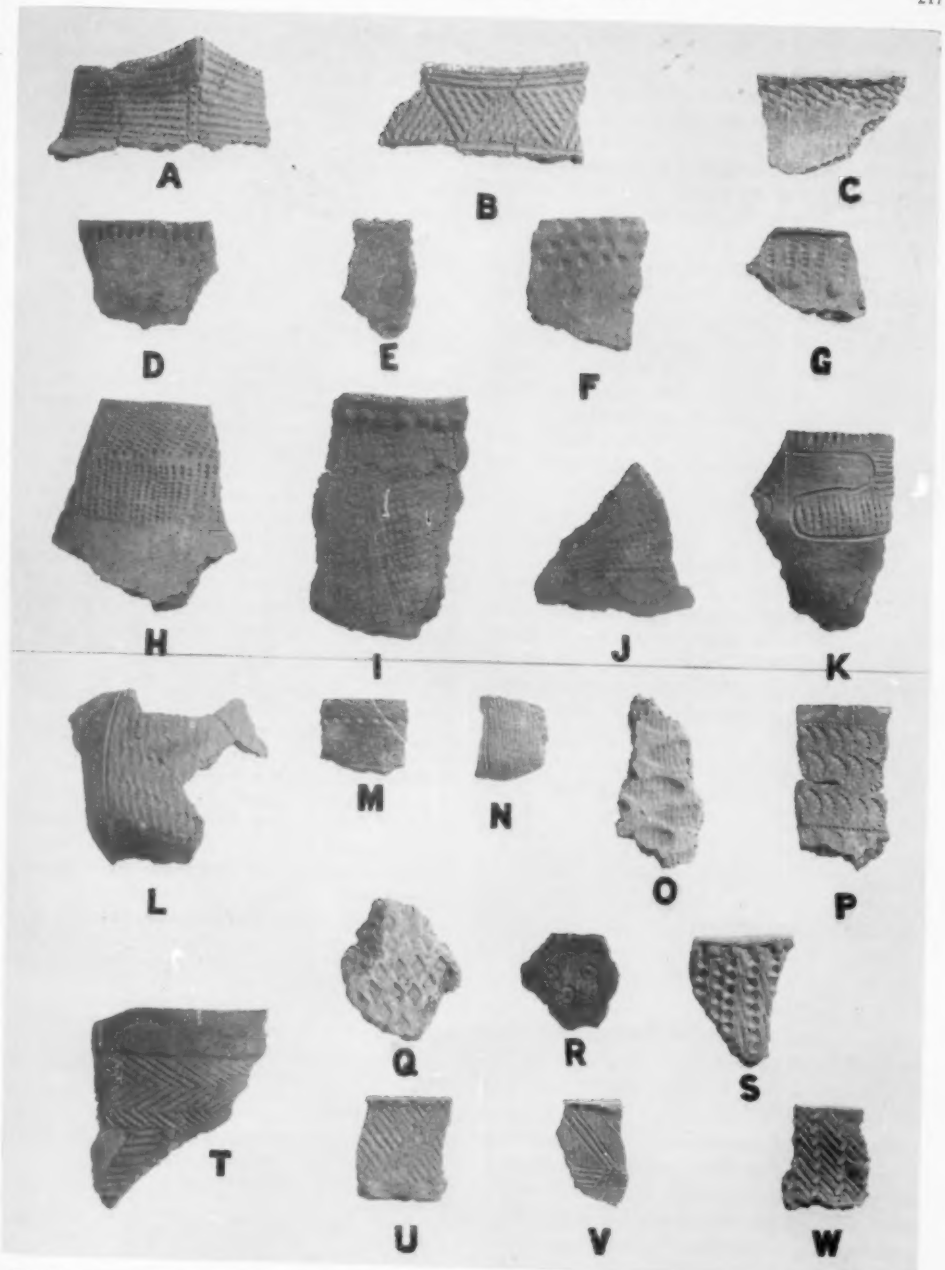

FIG. 64. Decorative features discussed in text: *a* and *b*, cord decorated; *c*, cord-wrapped stick stamped; *d*, plain stamped; *e*, notched rim; *f*, punctate rim; *g* and *h*, dentate stamped; *i*, dragged dentate; *j* and *k*, zoned; *l*, zoned and rocker stamped; *m*, crosshatched rim; *n*, brushed; *o*, ovoid; *p*, crescent stamped; *q-s*, punch stamped; *t* and *u*, incised rim; *v*, cross incised; *w*, incised rim and punch stamped. *a* and *b*, Canton ware; *c-e*, Weaver ware; *l-n*, Hopewell ware; others, Havana ware.

The analysis of the pottery then took the following steps:

1. This material was first sorted on the basis of the ware groupings and this data plotted according to the proportion of each ware present in a given layer, stratum, or surface collection of a site. The ware groups used were Canton, Weaver, Havana, Liverpool, and Hopewell.

2. In the different sites, trends were noted regarding the relative popularity through time of the main ware groups, namely, Weaver and Havana wares. It was also noted that the different sites had different proportions of these 2 wares. It was, therefore, assumed that those sites known from surface collections only which had a smaller proportion of Weaver ware could be considered earlier in time than those sites with a larger proportion. On this basis then, the sites were arranged in a temporal sequence.

The relationship of the Liverpool ware to the others was, unfortunately, not so clear. There was indication at one site (F'35) where there was no Weaver ware that the proportion of Liverpool ware was greater in the lower levels. On the basis of this, then, I have placed the Dickison site which has a preponderance of Liverpool ware earlier than any of the others.

3. The next step of the study was consideration of the distribution of the decorative features and modes within the ware groups. These features were plotted according to the proportion of each present in a given site or level. The proportions figured for each layer from excavated sites or surface collections were placed on a chart showing each in the temporal position indicated in the previous step. In this way the possible change in popularity of these features through time was indicated.

4. The final step of the analysis was in the study of these various charts to find out which of the recognized features showed cultural significance through time and/or space.

Ware Group Distribution. The most common wares in these sites are Weaver and Havana. These are both Middle Woodland wares and are set apart on the basis of the decisions made at the Hopewellian Pottery Conference in Springfield, Illinois, April, 1951 (Griffin 1952: 101-24). These wares and the others found at these sites can be briefly described as follows:

Weaver Ware

Tempering: crushed rock; particles abundant and fine.

Texture: compact.

Hardness: around 3.0 (Moh's Hardness Scale).

Color: reddish tan, with some grays and blacks; cores rarely different.

Surface Finish: plain surfaces with some very hard finish looking like polished surface cord marking of tightly-twisted cord in vertical parallel lines.

Decoration: rims notched or stamped with cord-wrapped stick, paddle edge, or plain stamp; lips sometimes scalloped; embossed nodes present.

Form: conoidal or globular jars with vertical rims.

Dimensions: diameters up to 18 inches; walls 6 to 10 mm. thick.

Liverpool Ware (Tentative)

Tempering: crushed rock and often abundant sand.

Texture: coarse to compact, great range.

Hardness: around 2.5.

Color: red and black with some yellowish tan.

Surface Finish: cordmarking with impressions sometimes indistinct; closely spaced cords fairly tightly twisted.

Decoration: incising in rim area; parallel incised lines; variety of punch stamping.

Form: not well known, seemingly similar to Havana ware.

Dimensions: large diameters; wall thickness 8 to 10 mm.

Havana Ware

Tempering: heterogeneous crushed rock, irregular and abundant.

Texture: medium to coarse.

Hardness: 2.0 to 3.0.

Color: tan with some black and reddish surfaces; cores often dark or blacker than exterior.

Surface Finish: plain or cord-marked; cordmarking of heavy cord, often irregularly applied.

Decoration: dentate, crescent, ovoid, and other forms of stamping in rim area; bodies sometimes decorated in zones set off by trailed lines filled in with stamping or incising; embossed nodes just below lip area.

Form: conoidal-based jars with vertical rim and slight shoulder; some flat bases.

Dimensions: diameters up to 24 inches in shoulder area; wall thickness 8 to 16 mm.

Hopewell Ware

Tempering: crushed limestone particles averaging 1 mm.; other crushed rock also used.

Texture: very compact and uniform.

Hardness: 3.0.

Surface Finish: very smooth; some types brushed.

Decoration: body usually zoned, zones being filled in with various forms of very finely executed stamping, incising, or brushing; zones curvilinear, some representing birds; rims finely crosshatched and set off from rest of vessel by row of punctates.

Form: shallow bowls to small jars; jars often quadrilobate, generally globular, with round or flat bases.

Dimensions: diameters 4 to 8 inches; wall thickness 5 to 8 mm.

Canton Ware

This has formerly been referred to as Maples Mills or Tampico pottery, but this name has been abandoned here since both refer to specific sites. We have used the name Canton after a town in the vicinity of the Gooden site where this type of pottery was plentiful. The terms "Maples Mills," "Tampico," and "Gooden" all have referred to the same type of pottery (Cole and Deuel 1937: 14-15).

Tempering: black angular crushed rock (hornblende?), about 3 to 6 mm.

Texture: medium and sometimes crumbly.

Hardness: 2.5 to 3.0.

Color: usually reddish brown.

Surface Finish: usually cord-marked with large loosely-twisted cords; cord markings not distinct.

Decoration: geometric designs, between lip and neck, usually pendant triangles and parallel lines, but some conventionalized animal forms, made by impressing two-ply cord into surface of pot.

Form: large globular jars with distinct shoulder and vertical rims; often 4 or 5 raised points on rim; some bowls; some undecorated vessels with collar made by folding back rim.

Dimensions: diameters up to 24 inches in shoulder area.

The Havana ware as here defined, is one that has been most discussed and described in previous publications, although under different terminology. This ware, as I have defined it, is Cole and Deuel's (1937: 40-2) type 2.

The ware grouping that I have set up in this paper as Liverpool merits special discussion at this point. First of all, it should be clearly pointed out that I consider it an experimental grouping and that it does not have the definiteness that Weaver and Havana wares have. It is made up primarily of materials that Cole and Deuel refer to as types 1 and 2a. To some this may seem an unusual grouping. It is based primarily upon the observation that at some of the sites considered material with the incised rim, cross-incised, and punch stamping decorations was of a paste containing more sand than the Havana ware. It seems wise then to give this a trial run to see whether, when it is sorted on these general characteristics, it shows any consistency through time and space. The general characteristics upon which Liverpool ware was selected were sandy paste and decorations composed of incising and punch stamping. There is some overlapping in the paste of this ware and Havana, even as there is in Havana and Weaver, and in these cases the general characteristics of decoration are the sole criterion for separation. It must be emphasized that this sorting of Liverpool ware is just a trial run whereas the other wares are pretty distinctly established.

When the pottery from the various sites was sorted on the basis of these ware groupings it was immediately observed that in the lower layers of each site there was proportionately less Weaver ware than in the upper layers. This suggested that through time Weaver ware had become more popular with the Hopewellian potters. The chart (Fig. 63) shows this increasing popularity of Weaver ware as a tool for establishing the sites in chronological order. In doing this sorting, soil strata were used where recognizable, otherwise the excavation units were used. A surface collection was treated the same as a single soil stratum or excavation unit. The bars on the left of the chart show the overlapping in time of the various sites on the basis of pottery wares. For example, it appears that F^{v}49 was occupied contemporaneously with the Clear Lake site, T^{v}1; and F^{v}574 was occupied before and during the earlier portion of the occupation of Mn^{v}15. It is possible, of course, that these sites were occupied more or less contemporaneously and show variations due to local preference. However, the stratigraphic evidence indicates strongly otherwise, and when the analysis of the pottery on the basis of decorative features was carried out it indicated some features that could be attributed to localized styles, but others that indicated the fundamental correctness of this temporal alignment. It is felt that the results of this chart can be construed as evidence toward the validity of the ware groups as cultural entities since they show significant variation through time and space. Liverpool ware might be excepted from this conclusion since not enough evidence is at hand to substantiate its apparent earliness.

The position of the wares is significant, especially that of the Canton ware. This ware has generally been considered as a Late Woodland pottery in Illinois; and, indeed, the results here agree with that interpretation. Wray has stated (1952: 156) that "there is continuity from Weaver" in this ware. He then lists some

features of decoration that overlap in these 2 wares. Perhaps a later group of sites than those utilized here would show a transition from Weaver to Canton similar to that shown here for Weaver and Havana. It appears from the meager data on the chart that there is a replacement of Liverpool ware by Havana ware similar to that of Havana by Weaver in the upper portions of the chart. The indication for this is slight, since we have only one site (F^{v}35) excavated by layers that indicates this trend along with a surface collection from P^{m}477-78. However, the paucity of this ware in the upper stratigraphic portions of the chart is supporting evidence for the earliness of this ware.

The position of the Hopewell ware is not too conclusive. The indication given by the chart is that it was present throughout the entire time span represented by these sites. One outstanding fact is that it is always a relatively small percent of the total. It is possibly significant that it is absent from the top strata of T^{v}1, F^{v}35, and P^{m}477 and 478, the latest and earliest units respectively, shown on the chart.

Distribution of Decorative Features and Modes. In turning to an analysis of the decorative features of the pottery, the sites were placed in their apparent chronological position as shown on the chart (Fig. 63). To do this certain arbitrary decisions had to be made. It was necessary to combine all of the decorated sherds from Stratum III at the Clear Lake site, and still there were only a few from this stratum to work with. The bars showing proportions of features in this stratum were left white on the chart as it seemed that the proportions derived from such a small number of decorated sherds could not be relied on. The materials from Stratum IIb of the University of Chicago excavations and those from Stratum II of the Illinois State Museum and Schoenbeck excavations were combined and treated together as one analytical unit. This was done because of the small amount of decorated sherds from each one of these strata, and the close similarity in proportion. The rest of the strata from the Clear Lake excavations were left as shown in Figure 63. In treating the decorative materials from the Hummel (F^{v}574) and Dickson (F^{v}35) sites it was necessary to treat them as a unit; that is, combining all levels, due to the small amount of material from each.

The decorative features and modes (Fig. 64) recognized in the analysis of this pottery can be briefly described as follows: (For correlation of these with published pottery type names see Fowler 1952: 146-8, 150; Deuel 1952, Table 2.)

Cord Decoration. A design of parallel lines, pendant triangles, and, rarely, conventionalized representations of mammals or birds, made by impressing two-ply cord in the neck area of the pot.

Cord-wrapped-stick Stamp. An impression made by a small stick with a cord wrapped around it. In Weaver ware this is applied on the rim obliquely to the lip and in Havana ware it has a limited use as a technique for filling in zones.

Plain Stamp. A long, narrow impression made by impressing a stick or edge of a paddle on the pot. Sometimes a sharp gash. Applied in the same areas as the cord-wrapped-stick.

Notched Rim. A dent in the lip made by a cylindrical object, giving the rim a wavy or scalloped edge. Appears in Weaver ware.

Punctate Rim. Single or multiple rows of hemiconical punctates placed parallel to the rim. Found in both Weaver and Havana wares, predominantly in the latter, and sometimes in Hopewell ware.

Bosses. Rounded lumps, usually on the exterior, formed by punching with a cylindrical object almost through the wall of the pot. Found in Weaver and Havana wares.

Dentate Stamp. A toothed stamp usually 1 to 1½ inches long, applied either in the rim and neck area or as a filler for body zones.

Dragged Dentate. A dentate stamping that is indistinctly applied in the neck and rim area, appearing in some cases as though deliberately dragged along the pot.

Zoned. A form of arrangement of designs in body decoration in Havana and Hopewell wares comprised of curvilinear zones set off from plain body areas by incised lines and usually filled in with stamping or incising.

Crescent Stamp. A curved stamp about ½ inch long, either plain or dentate.

Ovoid Stamp. An oval-shaped stamp, usually. This and the crescent are forms of rim area decoration.

Incised Rim. Decorations made by broad incised lines in V, herringbone, and parallel line patterns, sometimes with punctates applied on top.

Punch Stamp. Square, circular, straight, and other shaped marks made by various single-toothed implements and applied in bands in rim areas, sometimes over incising.

Cross Incised. Multiple parallel-incised lines with multiple incised lines crossing them, sometimes perpendicularly and sometimes diagonally, applied over cord-marked surface.

FIG. 65. Relative proportions of decorative features on sherds from certain Illinois sites. See Figure 63 for significance of numerals. Sites are arranged in temporal sequence. The second group of bars are left white because it is believed that the small number of sherds renders the proportions unreliable. Abbreviations used: CWS, cord-wrapped stick; Pl. St., plain stamped; Cres, crescent; Inc, incised; Dec, decorated; Punc, punctate; X hatch, crosshatched.

Cross (X)-hatched Rim. A series of parallel sharply incised lines diagonal to another series, applied in rim areas of Hopewell pottery and usually set off from rest of pot by a series of hemiconical punctates.

Rocker. A continuous curved zigzag, either plain or dentate, presumably made by rocking a stamping implement back and forth over the surface. Usually used as a technique for filling in zones.

Brushed. A series of parallel lines, apparently made with a handful of twigs or straw swept over the surface, used often to fill in body zones of some Hopewell pottery.

In studying the results of plotting the proportions of these design features within each site and aligning the sites in the suggested time sequence (Fig. 65), certain definite trends are indicated.

First of all, the position of cord decoration is late and is found only on Canton ware.

In the Weaver ware, the cord-wrapped-stick rim decorations seem to become increasingly popular along with notched rims, although the former is preponderantly more common. The cord-wrapped-stick stamp in the Havana ware in the same time range becomes less common. The plain stamp and the punctate rims seem to be minor features in the Weaver ware, but occur more frequently in earlier sites.

In studying the features common to Havana ware, certain facts stand out. First of all, the frequency of bosses varies from site to site; at Mn°15 it is around 33 percent, at the Steuben and Rench sites it is 1 percent or less, and at F°49 and T°1 it averages about 11 percent of the decorative features. This is easily understandable when it is noted that in the sites where bosses are rare the punctate rims and dentate stamping are most common. These features all utilize the upper rim area and are therefore mutually exclusive, i.e., when one of these is used there is no room for the other.

The next outstanding feature in the Havana ware is that called the punctate rim area. It is localized almost exclusively to the Steuben and sites close by and can be considered from the present data as a local style. This stands out most clearly when this feature is considered in its relationship to the dentate stamp feature. It is apparent that, except for the Steuben site,

SNYDERS SITE CALHOUN CO. ILLINOIS

SQUARE 5 R 2	CANTEEN WARE	HAVANA WARE	HOPEWELL WARE	LIVERPOOL WARE	TOTAL
LEVEL 1	25.0 8	71.9 23	3.1 1		32
2	1.2 1	93.0 40	4.7 2		43
3	4.7	91.7 156	3.6 6		170
4		95.1 180	4.7 9		189
5		99.0 184	1.0 2		186
6		100.0 98			98
7		100.0 67			67
8		98.9 96		1.1 1	97

FIG. 66. Analysis of sherds from the Snyders site, Calhoun County, Illinois, based on data in Griffin 1952b, p. 18.

the frequency of dentate stamping as a decorative feature is one that gradually increases to its maximum at the period represented here by the Rench site and then gradually decreases. The exception to this is the Hummel site where dentate stamp is 63 percent of the total. This could either indicate a bimodal popularity through time of this feature or a strong local preference at Hummel. More stratigraphic material is needed.

In this respect we could also consider the dragged dentate feature. It is confined to the Havana site and is obviously only a local variation of dentate stamping, differing from the other sites only in the careless method of applying. If the punctate rim is also considered as only a form of dentate stamping (punctate rim being applied with a single-toothed element but in such a way as to give a very similar decorative effect as with a multiple-toothed implement) and all 3 of these features are classed together as variations of dentate stamping, a better picture of the changing popularity of dentate stamping (Table 7) in general might be discernible.

In considering Table 7, it seems that there is about the same fluctuation as is shown for dentate stamping alone in Figure 65.

The zoned decoration in Havana ware seems to have a definite fluctuation in popularity through time (Fig. 65). It is but a small proportion of the total at Havana and increases to about 20 percent at F'49, and then decreases to about 8 percent. An interesting thing about this is that the peak seems slightly later than the dentate stamped peak.

TABLE 7

Site and Layer	Dentate, Dragged Dentate, and Punctate Rim Features Combined	
	Percent	Number
F'49 0-1 foot B.S.	32.3	10
T'1 All Exc. Stratum III	7.1	1
T'1 All Exc. Stratum II	26.3	10
F'49 1-2 foot B.S.	24.2	7
F'49 2-3 foot B.S.	27.5	11
T'1 Surface Coll.	33.3	1519
T'1 ISM-S Stratum I	25.0	3
F'49 Surface	45.2	109
P'500 Surface	72.8	236
T'1 U. of C. Stratum IIa	39.6	19
Ma'1 Surface	71.3	637
Mn'15 0-16" B.S.	44.0	55
Mn'15 16-24" B.S.	49.8	41
Mn'15 24-32" B.S.	25.0	10
F'574 All levels	63.0	22
F'35 All levels	2.4	1
P'477 & 478 Md. Fill	4.0	2

In my opinion, the distribution of the remaining features noted for Havana ware is rather inconclusive. There is a suggestion that crescent stamping persists throughout and that ovoid stamping is present only in the upper portions of the chart, exactly where zoning is most popular.

The indication from the chart is that incising as a form of decoration in Havana ware and Liverpool ware is early, as it appears predominantly in the lower portions of the chart. The indication is that it decreased in popularity. Where it appears in the upper portions of the chart, it is in surface collections (Steuben and Clear Lake sites).

In the Hopewell ware, crosshatching is slightly less popular than the other features. This is obvious since the crosshatched rim is a rim feature whereas the zoning is a body decoration. The rocker and brushed features are both means of filling in the body zones, and there is indication in this material that the brushed is slightly more popular and later. A larger sample of Hopewell ware sherds handled separately from the other wares and treated in the method used in this paper would possibly document some style changes within the Hopewell ware.

In making a study of the sherds on the basis of separating those that had a number of decorative features on one sherd, little if anything of significance resulted that would be of help in analyzing the relationship of one feature to another. There were very few sherds that showed both rim and body portions. A fruitful line of investigation would be a study of the whole vessels available in the many collections around the country to determine any significant relationships between decorative features on the rim area and those applied to body areas.

Summary, Conclusions, and Comments. In summarizing a few points stand out. The gradual shift in pottery from the Havana to Weaver ware in the Hopewellian sites in the central Illinois River valley has been demonstrated. In so doing, a convenient method of determining the relative temporal position of sites has been presented.

Those having a preponderance of Havana ware are earlier than those having a preponderance of Weaver ware.

There is further evidence that Liverpool ware is earlier than Havana ware and is gradually replaced by it. This shift from Liverpool to

Havana ware takes place in pre-Hopewellian times and is the culture referred to by Cole and Deuel (1937: 17-18, 200-5) and others as Central Basin.

As a problem for future investigation we suggest that this has significance on a basis wider than the central Illinois River valley. For instance, in the lower Illinois River valley, the pottery of the Jersey Bluff focus (Wray 1952: 159; Titterington 1943) seems to be of the same general cast as the Weaver ware and fits into the same general late and post-Hopewell time period.

Taking the data presented by Griffin for the Snyders site in Calhoun County (1952b: 18) and redividing it into the following ware groups, Canteen (a pottery group from the lower Illinois River valley very similar to Weaver ware), Havana, Hopewell, and Liverpool (one sherd of Griffin's Sister Creeks Punctated), and plotting it on a chart, results are obtained as shown in Figure 66. Canteen ware seems to displace the Havana ware in the upper levels of this site whereas Liverpool ware is found only in the lowest level. This is the same sequence that has been demonstrated for the central Illinois River valley. By comparing Figures 63 and 66, it will be seen that the position of Hopewell ware is essentially the same. A detailed study of the decorative features of the material from the Snyders site would be very interesting.

In southern Illinois, Maxwell has pointed out that there is a similar late Woodland horizon (1951, 1952). However, it is his opinion that it does not develop out of the earlier material found in definite Hopewellian village sites. This later pottery belongs to the Lewis and Raymond foci. The common Hopewell village pottery in southern Illinois is quite different from the Havana ware and has been called Jackson ware (Griffin 1952a; Neumann and Fowler 1952). However, it might be possible to order the southern Illinois sites on the basis of the relative proportions of Jackson and Lewis-Raymond pottery. For example, in 2 collections now at hand for analysis from this area, the Twenhafel site (J^{v}1, Jackson County, Schoenbeck Coll.) and the surface material from the Hubele site (Wh^{v}30, Neumann and Fowler 1952), we find the following proportions:

	Havana	Jackson	Raymond-Lewis	Hopewell
Twenhafel	32(2.1%)	1174(77.4%)	202(13.3%)	106(7.2%)
Hubele		988(78.6%)	33(2.6%)	236(18.8%)

This table is suggestive. It seems significant to us that the common pottery of the Hopewell village in both central and southern Illinois, Havana and Jackson wares, extends back into pre-Hopewellian horizons and that the late- and post-Hopewellian village materials are thin, cord-marked, predominantly conoidal, grit tempered, and lacking much decoration. In other words, it is suggested that we have here horizon markers in the prehistory of Illinois. Future investigation will either disprove, modify, or substantiate this suggestion.

Another significant point brought out here is the relatively stable proportion of Hopewell ware throughout these sites and the apparent uniformity of this Hopewell ware. I think this indicates the significance of this ware in the community; and if it was utilitarian ware, it must have been used by very few (see Griffin 1952a: 128). The traditional viewpoint is that it was a ceremonial pottery. There is a need for further study of the Hopewell ware as well as the other wares, based upon features other than decorative, as there are variations of vessel form that probably have cultural significance that are not apparent now.

A third point in this study is the fact that there were strong local styles such as punctate rim and dragged dentate. These seem to represent pottery from very specific sites, viz., Steuben and Havana. Recently (summer of 1952) the Illinois State Museum field party made a surface survey of a portion of the Twenhafel site (J^{v}1), and even without a detailed analysis one fact stood out: only one punctate Havana ware rim was found. The major ware at Twenhafel being Jackson, the finding of such an apparently localized variety may indicate a direct contact between Hopewellian peoples of the Steuben and Twenhafel sites.

In general, it seems that this study agrees with that of Bluhm (1951) in that it demonstrates a transition from the so-called Central Basin to Hopewell in the central Illinois River valley. The Central Basin occupation might be defined in this paper as that in which there is an absence of any wares other than Havana and Liverpool. Tentatively, it also seems to be characterized by the decorative features of punch stamped and incising. Certainly, a much more detailed study of this particular problem needs to be made with a much larger sample of pottery from those sites having only Havana and/or Liverpool ware. Of the 8 sites considered in this study, only F^{v}35 and Dickison

Mounds fall into this category. The other 6 sites can obviously be considered as belonging to the Hopewell phase of the Woodland occupation of Illinois.

There is a seeming agreement between our data on the Hopewell ware and the conclusions of Griffin (1952a: 119-20) in that he suggests that the brushing technique as a decorative feature is a late variation of the Hopewell ware. As was pointed out earlier, it is very possible that our chart is not sufficiently detailed for demonstrating the possibility of a change in time in the Hopewell ware. Once again, studies with a larger number of sherds from well-stratified sites would be necessary to demonstrate this.

In concluding, I suggest that the type of study presented in this paper can document the temporal sequence of Hopewellian sites as well as point out ceramic types approximating those of the aboriginal potters. This puts us in a better position to align temporally the other artifacts, houses, burial practices, and art work of the Hopewellian occupation in Illinois, and to understand the processes of cultural change that went on during this most remarkable prehistoric occupation of the eastern United States.

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AN ARCHAEOLOGICAL SITE IN THE HIGH SIERRA OF CALIFORNIA

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ALONG THE eastern side of the Great Valley of California is the Sierra Nevada, a great mountain chain 500 miles long and 75 wide. The Sierra Nevada has a gradual western slope and an abrupt eastern face fronting the arid Great Basin. The long western side, which contains the main timber belt, was heavily populated in its lower elevations in the pre-Caucasian period. In contrast, the High Sierra above 5000 feet was visited only seasonally by aboriginal groups. The archaeology of this latter zone is little known because it has been assumed that archaeological remains are scanty, and, as a consequence, little work has been carried on. Recent investigations have demonstrated, however, that at some of the seasonal campsites repeated occupation over a long period of time resulted in fairly extensive accumulations of occupational debris.

During the late fall of 1953, exploratory excavations conducted at Vermilion Valley in the High Sierra of Fresno County provided evidence of an extended period of intermittent habitation at an aboriginal camping place.

The Southern California Edison Company currently is constructing a large earth-filled dam across Mono Creek.* The project will result in complete flooding of Vermilion Valley, an area 5 miles long, averaging about ¾ of a mile across. At the invitation of R. W. Spencer, Manager of the Engineering Department of Southern California Edison Company, William J. Wallace and Edith T. Wallace of the University of Southern California surveyed the area between September 10 and 13, 1953. Of the 5 sites which they recorded, one appeared to merit further investigation, so from October 12 to 18, 1953, Donald W. Lathrap and Jack Nicoll representing the University of Southern California carried on a limited excavation at the site designated as Vermilion Valley 1. The Southern California Edison Company provided lodging and meals for the field parties. The company personnel also extended many other courtesies which contributed greatly to the success of the trips. The material recovered on the 2 trips forms the basis for this report.

Vermilion Valley, a protected depression, lies some 65 miles east of Fresno and 10 miles west of the crest of the Sierra Nevada. It is a part of the canyon of Mono Creek, one of the major tributaries of the South Fork of the San Joaquin River. The valley is typical of the many U-shaped, glaciated canyons found in the High Sierra. Its level floor, lying between 7500 and 7600 feet elevation, is the alluviated bed of a post-Pleistocene lake impounded by a terminal moraine. The flora is that of the Canadian life zone with the dominant trees: lodgepole pine, *Pinus contorta* var. *murayana* Engelm.; Jeffrey pine, *Pinus ponderosa* var. *jeffreyi* Vasey; and aspen, *Populus tremuloides* Michx. Sierra juniper, *Juniperus occidentalis* Hook., and white fir, *Abies concolor* Lindl. and Gord., occur in lesser numbers. Red fir, *Abies magnifica* Murr., is found at a few moist localities which are protected from the afternoon sun. Since it is in the rain shadow of Kaiser Ridge, Vermilion Valley is somewhat drier than a typical Canadian life zone station, and a small sage, *Artemisia* sp., is the most common shrub in the eastern end of the valley. Deer, black bear, mountain lion, beaver, and coyote are the larger mammals which inhabit the valley. Smaller species, particularly the chipmunk, are also present. Rainbow trout are plentiful in Mono Creek and possibly were even more numerous in prehistoric times.

The Indians inhabiting Vermilion Valley at the time of Caucasian contact probably were Western Mono, but their subdivision cannot be specified with certainty. The Northfork Mono, Yayanchi (Gayton 1948b: 153) can be excluded. E. W. Gifford gives a detailed map showing the extent of Northfork Mono occupation in the High Sierra, and their lands did not extend either south or east of the Middle Fork of the San Joaquin River (Gifford 1932: 15 and Fig. 1). The inhabitants of Vermilion

* Gratitude is expressed for the cooperation shown by the personnel of both Southern California Edison and the Bechtel Corporation, which is doing the actual construction work. William Riley and Harold Barber, resident engineers for Southern California Edison were especially helpful. The assistance of K. O. Taylor of the Bechtel Corporation is also gratefully acknowledged. William J. Wallace, James A. Bennyhoff, and Francis A. Riddell read and criticised the paper and many of their suggestions are included in its final form.

Valley used pottery while the Northfork Mono did not (Gifford 1932: 25). Between the Northfork Mono and the Wobonuch on the Kings River there were several small groups of Western Mono which are ethnographically unknown. Because of the geography of the region, the group known as the Posgisa, which wintered in the Auberry and Tollhouse region, could most easily have held the basin of the South Fork of the San Joaquin as a hunting area (Gayton 1948b: 153, 254). Pottery was made, or at least used by these Indians (Gayton 1948b: 161).

Sporadic or even repeated visiting of Vermilion Valley by the Owens Valley Paiute is another possibility which cannot be ruled out. Ethnographic information indicates that the Owens Valley Paiute habitually used specific summer camping spots in the basin of the South Fork of the San Joaquin. These were resting places along their main trail into the San Joaquin River Canyon, which crossed Paiute Pass and followed Paiute Creek down to its junction with the South Fork of the San Joaquin. For 3 of these camps the Owens Valley Paiute have names. The westernmost, at Blaney Meadows, is within an easy day's walk of Vermilion Valley (Steward 1933: 325-7 and Map 1).

The Site and the Excavation. Vermilion Valley 1, the site investigated, is located at the eastern end of the valley on a low, flat-topped ridge running from northeast to southwest, parallel and immediately adjacent to Mono Creek. The rise consists mainly of massive granite bedrock which resisted complete reduction during the glaciations. The granite is largely covered with coarse sand and gravel but in several places it protrudes in low rounded masses showing the effects of glacial action. On the northwestern side the ridge descends to a level meadow extending about ¼ mile to the cliff bounding the valley. To the northeast it slopes to the narrow, level, flood terrace of the creek. The ridge averages about 4½ feet higher than the meadow and is 5½ feet above the flood terrace. The northeastern end of the site is bounded by a large dome of granite, whereas the southwestern edge merges gradually with the meadow and has been partially destroyed by the encroachment of a borrow pit. Evidence of aboriginal occupation completely covers the ridge and its slopes extending to, but not onto, both the meadow and the flood terrace. The site is approximately square, measuring 160 feet along the ridge and the same from meadow to stream terrace. The natural sands and gravels of the locality have been discolored a dark gray by human occupation, and contain a considerable amount of charcoal and obsidian chips.

At the foot of the dome of rock at the northern end of the site are 4 shallow circular depressions between 10 and 15 feet in diameter. Three groups of bedrock mortars are associated: one on top of the large dome; the second in a mass of granite surrounded by the site; and the third 90 yards north of the site. This location has been much used as a campground by recent hunters and hikers but aside from the resulting litter it has been little disturbed. Tire tracks run over the site but they have not cut deeply into the deposit. Except for the borrow pit the campsite has undergone little change either from natural or artificial causes since its aboriginal inhabitants left. Several small lodgepole pines and a sparse cover of grass and sage grow on the site.

As a location for Indian habitation this spot has certain definite advantages. It is both open and well drained. Mono Creek provided a never-failing source of water, but the settlement was sufficiently elevated so that in a period of flood the camp might be surrounded but never inundated. Since it is at the foot of the last riffle of the creek as it enters Vermilion Valley, ideal fishing conditions prevailed.

Hunting must have been a major economic activity of the summer visitors, as the Canadian life zone is somewhat deficient in those plants which the Indians used as food. Acorns, their staff of life, had to be carried in from considerable distances. Fishing may have been of some importance, but there is no direct evidence to indicate that it was. The locality undoubtedly served also as a resting place for trading parties on their trips across the Sierra. Trade between the Western Mono and Owens Valley Paiute flourished in precontact times with parties crossing in both directions (Gayton 1948b: 160, 259; Gifford 1932: 19; Steward 1933: 257). Most of the traveling was done by the Owens Valley Paiute. Commodities passing from east to west were: salt, piñon nuts, baskets, poison, rabbit skin blankets, balls of tobacco, obsidian, and red paint. These were exchanged for: buckskin, shell beads, Yokuts

baskets, arrow canes, acorns, manzanita berries, and, in historic times, glass beads (Gayton 1948b: 259; Steward 1933: 257; Sample 1950: 18). The major trade trail, crossing Paiute Pass and passing some 8 miles west of Vermilion Valley, has already been mentioned (Steward 1933: 329 and Map 1). A route over Mammoth Pass and down the Middle Fork of the San Joaquin River, which was used in the intercourse between the Northfork Mono and the Owens Valley Paiute, passed approximately 15 miles north of Vermilion Valley (Gifford 1932: 19; Steward 1933: 329). That there was a trans-Sierra trail running through Vermilion Valley is less definitely established, but the existence of such a trail seems highly probable. In his discussion of Sierra passes used by the Indians, Steward states:

> . . . and one between the headwaters of the South and Middle forks of the San Joaquin, . . . 12,000 feet (possibly a nameless pass or Paiute pass, 11,409, west of Bishop). Chalfant mentions one at the head of Rock creek . . . (Steward 1933: 329).

An examination of the topographic map (U.S. Geological Survey, Mt. Goddard Quadrangle, Edition of 1912, reprinted 1923) indicates that these 2 passes are probably one and the same, and can be identified as Mono Pass. Mono Pass is just a few feet over 12,000 feet in elevation, and is the only one at the head of Rock Creek. Once one crosses Mono Pass going from east to west, there is no feasible route except down Mono Creek and through Vermilion Valley. This pass should not be confused with the pass west of Mono Lake, also called Mono Pass, which was used by the Mono Lake band of Paiutes on their trading trips into Yosemite.

The Indian occupation of Vermilion Valley was undoubtedly seasonal. In the Southern Sierra the maximum altitude at which Indians maintained permanent camps is 4000 feet (Barrett and Gifford 1933: 129; Voegelin 1938: 41). Local conditions modified the rule somewhat as localities at slightly higher altitudes sometimes remained relatively snow-free throughout the winter, and thus were habitable. The Vermilion Valley site is almost twice that high, lying exactly on the 7600 foot contour line, and is located so as to favor a maximum rather than a minimum drifting of snow. Because of the high cliffs on either side, it receives little sunlight during the winter months. Since the material culture of the Western Mono was lacking in those items which made living in snow comfortable and practical (Gayton 1948b: 216), occupation at the site must have been limited to the period when the locality was snow free, roughly from the middle of May to the middle of October. Bennyhoff recently has summarized the evidence concerning aboriginal occupation patterns in the High Sierra of Yosemite, the region immediately to the north. His conclusions agree essentially with those expressed herein (Bennyhoff 1953).

The excavation of Vermilion Valley 1 lasted only 6 days. It was difficult to decide how the available time should be used in order to gain maximum information. Most of the first day was spent in collecting data for a topographic map. The decision was then made to investigate one of the circular depressions in order to determine if it represented a house pit. A pit was selected and an area 10 by 15 feet encompassing about ⅔ of the depression was laid out in 5-foot squares. The plan was to excavate each in 6-inch horizontal levels. However, as a house floor was encountered (at some places slightly above and at others slightly below a depth of 6 inches) the material from each square between surface and house floor was treated as a unit, so that the floor could be exposed before it was cut through. After the floor had been cleared and recorded, one square was taken through to base in horizontal 6-inch levels. Another also was carried one level below the house floor before a snow storm made it necessary to back fill and abandon the project. In the course of the excavation all dirt was loosened and examined by troweling before being removed by shovels. A test excavation had been made previously by the Wallaces on the slope of the site toward the meadow. Material recovered from both excavations, and by surface collecting is included in the report.

Physical stratigraphy was noted but in how far it represented a purely local condition within the site rather than the site as a whole could not be determined. Depth to sterile base was variable in the pit; the maximum in a narrow fissure between 2 masses of bedrock was 30 inches, but the average was only about 20 inches. Much of the base was bedrock, the spaces between being filled with a bright orange sand and a coarse, bright yellow gravel. Immediately above was a gray-brown sand containing many obsidian chips but little visible

charcoal. The top layer consisted of coarse, angular granite sand and grit, dark gray in color, containing much charcoal, ash, obsidian chips, and many large granite cobbles, mostly fire broken. The house floor marked the boundary between the two layers. The tunneling of rodents was noticeable in the deposit, but was not extensive.

Cultural Remains. The excavation yielded some information concerning house construction and a number of artifacts. The house pit, 15 feet in diameter, had been dug to an average depth of about 13 inches, with the sides of the pit nearly vertical. The floor sloped gradually to its center, being saucer-shaped rather than absolutely flat. A partial ring of rocks extended around the northwestern, or uphill, side of the pit, possibly the remains of an embankment to prevent rain water from running into the house. Large fragments of burned and partially decayed, unburned wood, including a large slab of Jeffrey pine bark, were found on the floor of the house. Four small posts, still erect in the ground, were burned off at floor level. One was at the southern edge, another was located 5 feet east of the central hearth, well within the floor area, and the remaining 2 were within 6 inches of each other and a foot from the western edge of the hearth. A stump of a lodgepole pine, 7 inches in diameter, was uncovered 2 feet south of the hearth. This was burned off and bent over so that it was flush with the floor.

The conical pole and bark slab house is the expectable form in the area (Gayton 1948b: 260; Gifford 1932: 20). It has, however, no posts within the floor area. The 3 posts within the Vermilion Valley house are small and may not have served as structural members. In dimensions and depth of excavation the Vermilion Valley house pit agrees well with the ethnographic descriptions. The tree in the center of the house floor probably was cut down when the pit was dug so that the log could be used in the construction of the house. The Western Mono method of felling a tree would leave just such a stump:

> To fell a tree they were burned around the base. Men had short stout sticks (to'nap) with which they poked, jabbed, and dug at the burning portions to make the fire go deeper. Limbs and poles were cut to length by the same means. (Gayton 1948b: 266)

The granite sands and grits of the site do not pack firmly, so the floor was not appreciably harder than the rest of the soil. In most places it could be identified only as a layer containing much ash and charcoal, a superabundance of obsidian chips, and a large amount of decayed organic material. Ash, which had spilled out of the hearth, made the floor level easy to determine in the center.

The centrally located hearth was originally a circular excavation 6 inches deep and 2 feet in diameter. This coincides with descriptions of the Western Mono hearth (Gayton 1948b: 260). In the course of use it had become filled with solid ash to a depth of 10 inches. The ash had spilled over the edge forming a dome-shaped mass nearly 3 feet in diameter. Several complete arrowpoints and a great amount of charred bone were contained in the ash.

Evidence of the dietary habits of the inhabitants of this house was recovered in the form of both vegetable and animal remains. On the floor 5 feet south of the hearth a mass of partially decomposed pine nut shells was encountered. These were identified at the University of California Herbarium as: "too large for either Jeffrey Pine or Lodgepole Pine, shells too thin for Piñon Pine, *Pinus cembroides* var. *momophylla* Voss, almost certainly seeds of the Sugar Pine, *Pinus lambertiana* Douglas." The sugar pine, typical of the upper Transition life zone, is common on the lower slope of the Sierra to the west of Vermilion Valley. It is the favored nut pine of the Transition zone (Gayton 1948b: 180). The nuts found in Vermilion Valley seemingly were carried in from the west, possibly from a distance of 20 or 30 miles. A charred acorn, also recovered from the house floor, was identified by the University of California Herbarium as: "probably Interior Live Oak, *Quercus wislizeni*, A. DC." This oak is characteristic of the Upper Sonoran life zone so the acorn must have been imported from more than 30 miles to the west. The presence of both these foods gives support to the belief that the inhabitants of the house were Western Mono.

A number of bone fragments, almost all charred, were collected. The soil conditions of the site are such that the uncharred bone had markedly decomposed. The collection is so fragmentary that no real attempt at species identification has been made, but most of the fragments appear to be from deer. The high percentage of charred bone is interesting as the same condition prevailed at Slick Rock Village

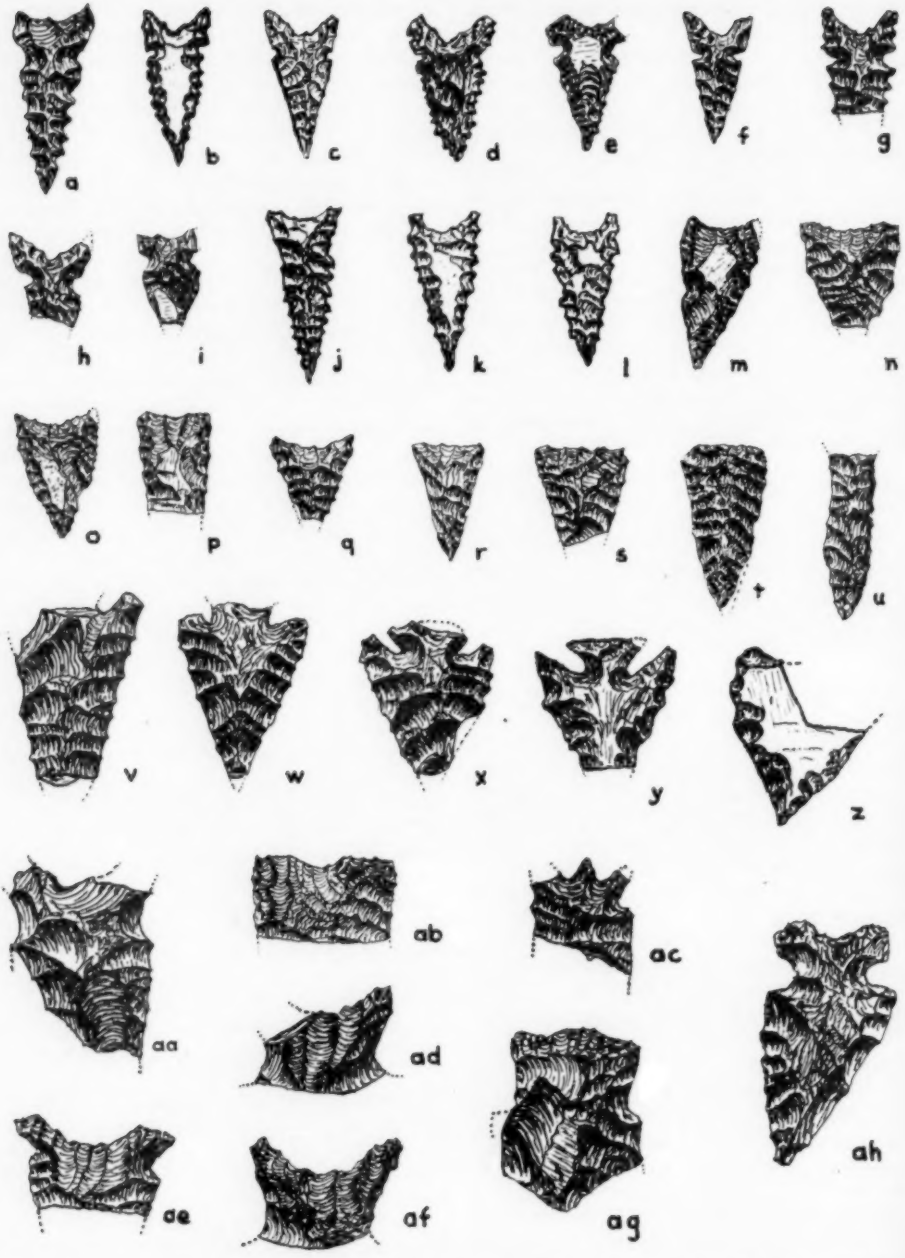

FIG. 67. Projectile points from a Vermilion Valley site, possibly Western Mono, in the High Sierra of California.

	shape	group	length cm.	width cm.	thickness cm.	weight grams	location	illustration Fig. 67
Cat# 9	1	1	1.6*	.9*	.3	.42	surface	i
19	1	1	2.6	1.1	.3	.46	backdirt, excavation of house pit	c
61	1	1	1.6*	1.2	.3	.56*	on house floor	g
117	1	1	2.8	1.3	.4	.98	above house floor	a
118	1	1	2.0	1.1	.3	.40	above house floor	f
147	1	1	2.9	1.0	.2	.37	from hearth	b
148	1	1	2.6*	1.2*	.3	.81*	from hearth	-
151	1	1	2.2	1.3	.2	.45	on house floor	d
189	1	1	2.1	1.1*	.3	.52	above house floor	e
245	1	1	1.3*	1.3*	.3	.37*	on house floor	h
247	1	1	1.4	-	.2	-	on house floor	-
11	1-2	1	1.2*	1.3	.3	.67*	surface	-
60	1-2	1	2.6	1.1	.3	.61	on house floor	j
149	1-2	1	-	1.2	.2	-	from hearth	-
26	2	1	2.2	1.1	.2	.43	above house floor	l
27	2	1	1.9	1.3	.3	.63	above house floor	o
145	2	1	2.8	1.1	.3	.52	from hearth	k
146	2	1	2.3	1.3	.4	.92	from hearth	m
150	2	1	.8*	.9	.3	-	from hearth	-
194	2	1	2.1*	1.3*	.3	.72*	above house floor	-
246	2	1	1.3*	1.3*	.2	.28*	on house floor	q
257	2	1	1.6*	1.2	.3	.72*	above house floor	p
258	2	1	1.7*	1.6	.3	.80	above house floor	n
20	3	1	-	1.3	.3	-	backdirt, excavation of house pit	-
190	3	1	1.8	1.1	.2	.30	above house floor	r
256	3	1	2.5	1.3	.3	.91	above house floor	t
259	3	1	1.7	-	.2	.25*	above house floor	-
280	3	1	1.5*	1.8	.3	.64*	above house floor	s
-	4	2	3.0*	2.1*	.4	-	surface Wallace collection	v
10	4	2	2.7*	2.1	.4	1.91*	surface	w
62	4	2	2.1*	2.3	.3	1.30*	on house floor	y
153	4	2	-	-	.3	-	on house floor	-
279	4	2	2.4*	2.2	.4	1.56*	above house floor	x
95	5	2	2.6*	2.1*	.5	1.62*	12" - 18" deep (below house floor)	z
-	6	2	1.6*	1.7	.3	-	surface Wallace collection	ac
-	7	2?	-	2.3	.3	-	surface Wallace collection	ab
-	7	2?	-	-	.4	-	surface Wallace collection	-
-	7	2?	-	1.9	.4	-	Test Pit 1 Wallace	-
8	7	2?	-	-	.5	-	surface	-
-	8	3	-	2.4	.5	-	surface Wallace collection	ae
63	8	3	3.2*	2.6	.8	5.34*	on house floor	aa
262	8	3	-	2.3*	.7	1.82**	above house floor	af
281	8	3	-	2.2*	.7	2.19**	above house floor	ad
261	9	3	3.8	2.1	.6	3.74	above house floor	ah
152	10	3	-	-	.6	-	on house floor	-
260	10	3	-	2.2	.8	5.00*	above house floor	ag

* measurement incomplete
** measurement less than half original

TABLE 8. Dimensions and provenience of projectile points from Vermilion Valley.

in Tulare County. At this site, their occurrence has been interpreted as a ceremonial disposal.

This latter feature probably reflects a method of disposal of offal rather than culinary practices. (Wukchumni hunting magic demands that dogs never be allowed to touch deer carcass remnants [Gayton 1948a: 70].) (Fenenga 1952: 343).

Though this practice has not been recorded for the Western Mono groups, the same explanation probably is valid here. The great number of fire-broken stones found in the house may indicate that the pottery and steatite vessels were insufficient in number for culinary needs, so stone boiling in basketry containers was also practiced.

In the course of the excavations, approximately 300 artifacts were recovered. Unfortunately nearly ⅔ of these were flake scrapers, a nondiagnostic class of artifact. All the articles of Indian manufacture are either of stone or of pottery. Almost all the flaked stone is obsidian, mainly of the opaque, black variety. However, banded, transparent pieces were also frequently met with as were dark red flakes. Presumably all obsidian was obtained from the eastern side of the Sierra (Heizer and Treganza 1944: 315 and Map 1). Two pieces of chert or opal, one fragment of rock crystal, and a large flake of a dense, fine grained, dark gray, igneous rock are the only nonobsidian flaked specimens. Granite was used for pestles, manos, and hammers. Three pieces of steatite and 22 potsherds, all but 4 of which were found on the surface, make up the remainder of the aboriginal artifacts. Articles of Caucasian manufacture include 6 glass beads and 6 pieces of bottle glass. The great majority of the artifacts are from the house pit and form a cultural unit representing the last phase of occupation at the site. The only artifacts which can definitely be said to antedate the construction of the house are: 1 point, 5 blades, and 14 scrapers, only 6.66 percent of the total.

Projectile points are by far the most numerous of the diagnostic artifacts. Of the 62 specimens which can be identified as points 46 can be classified as to shape. Most of the specimens were found either on or above the house floor. There is a neat correspondence between shape and weight within the group of points, a condition also noted at Tommy Tucker Cave in Lassen County, California (Fenenga and Riddell 1949: 209). If the Vermilion Valley points are divided into 3 groups, those weighing under 1 gram, those weighing 1 to 3 grams, and those weighing more than 3 grams, all points of a particular form are confined to a single weight group.

Group A. Specimens weighing less than 1 gram.

All points in this group exhibit the same basic form, a narrow-based, straight-sided isosceles triangle. Though more numerous subdivisions are possible if subtle criteria are used, the following 3 forms are felt to express the most significant differences.

Shape 1. A narrow-based, straight-sided triangle with small side notches and a concave base. The basal concavity extends the full width and tends to be V-shaped. Of 11 specimens, 4 have serrated sides. (Fig. 67, *a-i*)

Shape 2. A narrow-based, straight-sided triangle with basal concavity. The concavity extends the full width and tends to be U-shaped. Of the 9 specimens, 2 have serrated sides. (Fig. 67, *k-q*)

In addition there are 3 specimens intermediate between Shapes 1 and 2, having faint suggestions of side notches. Two have serrated sides. (Fig. 67, *j*)

Shape 3. A narrow-based straight-sided triangle lacking indentations on sides and base. Included are 5 specimens, none of which is serrated. (Fig. 67, *r-t*)

Of the 16 unclassifiable fragments 10 appear to belong in Group A.

Group B. Specimens weighing between 1 and 3 grams.

Shape 4. An isosceles triangle with straight sides, relatively broad base, and deep diagonal corner notches forming well-defined barbs and an expanding flat-based stem. There are 5 specimens. (Fig. 67, *v-y*)

Shape 5. A single fragment, which if complete would be heart-shaped, quite possibly a reject. This is the only point from beneath the house floor. (Fig. 67, *z*)

Shape 6. A single fragment, parallel-sided with 2 side and 2 basal notches forming a small, pointed stem, and small, pointed barbs. (Fig. 67, *ac*)

Shape 7. Sides parallel, straight to convex; base broad, slightly concave. Included are 4 specimens, all small fragments. These possibly belong in Group C. (Fig. 67, *ab*)

Of the 16 unclassifiable fragments 6 appear to belong in Group B.

Group C. Specimens weighing over 3 grams.

Shape 8. Body form unknown. Characterized by basal concavity and broad, shallow notches extending down the sides from the corners, leaving 2 everted basal barbs. There are 4 specimens. (Fig. 67, *aa, ad, ae, af*)

Shape 9. Leaf shaped with side notches and basal concavity. The one specimen was originally larger, but has been broken and reworked to a small asymetrical point. (Fig. 67, *ah*)

Shape 10. Body form unknown. Characterized by broad, rectangular stem and weakly-developed shoulders. There are 2 specimens of this form. (Fig. 67, *ag*)

Additional details concerning the points are given in Table 8.

On the basis of the weight-function relationship recently established the points of shapes 1 to 6 must be regarded as arrowheads, those of 7 are doubtful, while those of 8 to 10 appear to have served some other function (Fenenga 1953).

The point assemblage from Vermilion Valley as a whole is remarkably similar to the collection from Iny-2, an historic Owens Valley Paiute settlement on the eastern side of the Sierra 60 miles to the south. The similarity exists not only in the forms present but also in the percentages of their occurrence. This relationship is obscured by the difference between the typologies used for the two lots of material. In order to demonstrate the analogy a concordance of types has been prepared, Table 9 (Riddell, H. 1951: 17 and Table 1). In size, also the Iny-2 specimens agree with those from Vermilion Valley 1. Types 1 to 9 from Iny-2 (shapes 1 to 3) are all small. They range from 1.3 to 2.8 cm. in length and would certainly fall mainly in group A. The somewhat larger measurements of Iny-2 type II (shape 4) would place it in group B.

A comparison with the projectile points from Tommy Tucker Cave, a protohistoric Northern Paiute site about 220 miles to the north, also is instructive. Here the dominant Vermilion Valley forms, 1, 2, and 3, are represented only by a single specimen of shape 1 (type 5 of Fenenga and Riddell). At Tommy Tucker Cave the most prevalent form is Vermilion Valley's shape 4 (type 1 of Fenenga and Riddell), which again has an average weight of between 1 and 2 grams. The Tommy Tucker type 8, somewhat similar to shape 8, is the second most common form. As at Vermilion Valley it has a weight of over 3 grams (Fenenga and Riddell 1949: 209, Table 13, and Fig. 58).

Of the 4 small points recovered at Slick Rock Village in Tulare County, 3 appear to be of the Vermilion Valley shape 2 and one of shape 1 (Fenenga 1952: 345).

The small triangular, side-notched, concave-based point (shape 1, group A) is extremely common throughout most of the Sierra Nevada. Its distribution has been worked out elsewhere (Lathrap, n.d.). Frequently it is associated with historic sites and Caucasian trade goods. It recently has been demonstrated to be the dominant historic type in the Lake Tahoe region (Heizer and Elsasser 1953: 14 and Fig. 1). This point type may prove to be the most useful artifact for marking the protohistoric to historic period in the Sierra Nevada.

The small triangular point lacking side notches (shapes 2 and 3) seems to have the same chronological significance, as its association and intergradation with the preceding form, both at Vermilion Valley 1 and Iny-2 demonstrates. Its distribution also has been plotted and the same correlation with Caucasian material has been noted (Lathrap, n.d.). The difference between the notched and unnotched forms seems to have only geographical significance. At both Vermilion Valley and Iny-2 the ratio between the 2 forms is roughly 1:1 (Table 9). To the south in the Kern River Valley the unnotched variety appears to be dominant (Lathrap, n.d.), as it is at Slick Rock Village (Fenenga 1952: 345). North of Vermilion Valley the notched form becomes predominant, so that in the Tuolumne River Canyon it exceeds the unnotched form by a ratio of 16:1 (Lathrap, n.d.), and in the Lake Tahoe area by a ratio of 5:1 (Heizer and Elsasser 1953: Fig. 1). The small, unnotched, triangular point thus is diagnostic of the protohistoric period in the extreme south of the Sierra Nevada.

The chronological position of the corner notched form (shape 4) in the southern Sierra-Owens Valley area is not as clear. The evidence from both Vermilion Valley 1 and Iny-2 suggests that it is contemporaneous with the small triangular types but numerically of less importance. It may have been of greater importance at an earlier period. While it is common archaeologically in Owens Valley, a Paiute informant there regarded it as strange and wanted to put side notches in it (Steward 1933: 262). In southern Nevada this type is considered as typical of the Moapa Valley

TABLE 9. CONCORDANCE OF VERMILION VALLEY AND INYO 2 POINT COLLECTIONS

Riddell's types	1–2	3	4–5	6	7,9	8	10	11	12	13	—
No. of specimens, Iny-2	12	4	8	1	17	3	4	6	1	2	—
Shapes described herein	2	3	—	1–2	1	—	—	4	8	—	5,6,7,9,10
No. of specimens, V.V.1	9	5	—	3	11	—	—	5	4	—	9

Pueblo groups rather than of the Paiute (Harrington 1933: 125 and Fig. 56, *a-d*). Farther north, nevertheless, it is certainly the characteristic, protohistoric type among the Northern Paiute (Fenenga and Riddell 1949: 209 and Fig. 58). This is not to say that it did not occur earlier in northeastern California.

Four fragmentary stone perforators were found, one from the surface, and 3 from the house pit. Two, which have a diamond cross section, show the kind of use flaking characteristic of drills. One appears to have been rotated mainly in a clockwise direction while the other exhibits use injury on the opposite surfaces. One specimen is of obsidian, the other of opal (Fig. 67, *u*). The remaining 2 perforators have thin, lenticular cross sections and would have been more suitable for use as awls.

Blades were recovered, exhibiting a variety of forms. A large oval example came from a depth of 24 inches in the test pit dug by the Wallaces. It is crudely made, mainly by percussion flaking. Its dimensions are 8.64 by 5.22 by 1.56 cm. (Fig. 68, *m*).

The tip of a large, pointed blade was found below the house floor. The flake scars are large but evenly placed (Fig. 68, *d*). Eight small fragments, possibly of similar blades, also were collected, 5 from the house pit, 2 from the mixed zone immediately beneath the house floor, and 1 from below the house floor. Of these, 6 are of obsidian, 1 of rock crystal, and 1 of chert.

Four small thin blades of obsidian were found. One, complete, is irregular in outline, tending to be semilunar. Its dimensions are 3.40 by 2.23 by .65 cm. (Fig. 68, *e*). It came from the hearth. The other 3, all fragmentary, appear to have been leaf shaped (Fig. 68, *c*). One is from the surface, the other 2 from the house pit.

Seven small fragments of blades are unclassified.

Completely different from any of the above are 2 fragmentary blades with parallel sides and concave base. These exhibit beautifully controlled, diagonal, ribbon flaking (Fig. 68, *a, b*). One was definitely associated with the house, while the other was from the mixed zone immediately beneath the house floor. This type of blade is widespread in the southern Sierra, and may have a respectable antiquity (Lathrap, n.d.). Its occurrence both here and at Slick Rock Village confirms that it survived until the contact period. Fenenga (1952: 345) designates them as large points. Among the Owens Valley Paiute, blades of this form were used as "skinning knives" (Steward 1933: 267 and Fig. 3). Obsidian hunting knives were also employed by the Wobonuch Mono (Gayton 1948b: 262).

Another group of artifacts, best classified as blades, is represented by 10 specimens. They are small, narrow, and thick, coming to a blunt point. They are flaked back from both edges of both sides, but several are closer to plano-convex than to lenticular in cross section. All are broken off square at the end opposite the point and it could not be determined whether they represent fragments of larger artifacts or complete tools. None of the other artifacts obtained from the site would have produced fragments of this shape. All show the effects of heavy use at and near the point. The dimensions of the largest are length 3.2 cm.; width .9 cm.; thickness 1.0 cm. They are all of obsidian. Four came from the surface of the site, 3 from the house pit, 2 from below the house floor, and 1 from the test excavation made by Wallace (Fig. 68, *f*).

A single hook-shaped object of obsidian, flaked back from both edges of both sides, was recovered from the house pit (Fig. 68, *h*).

Scrapers are by far the most common artifacts at Vermilion Valley 1. With one exception these are merely flakes of obsidian, delicately retouched along one or more edges. The one example which has been carefully formed is pear-shaped and can be considered as a stemmed end scraper. Probably it was hafted. Its dimensions are 2.65 by 2.19 by .45 cm. (Fig. 68, *g*).

The flake scrapers have been divided into 6 arbitrary, descriptive groups, though actually there is a complete intergradation among the forms. Retouching is mainly by pressure flaking, and from one side only. In rare cases both sides of an edge have been flaked.

1. *Side Scrapers.* These are elongate flakes with one of the longer sides retouched for part or all of its length. Length ranges from 4.4 to 1.1 cm.; width from 3.0 to .8 cm.; thickness 1.0 to .1 cm.; length of retouched edge 3.3 to .8 cm. This is by far the most common type. There were 119, specimens of which 3 were from the surface, 90 definitely associated with the house, 18 from the mixed zone immediately below the floor, and 8 from definitely below the floor (Fig. 68, *k*).

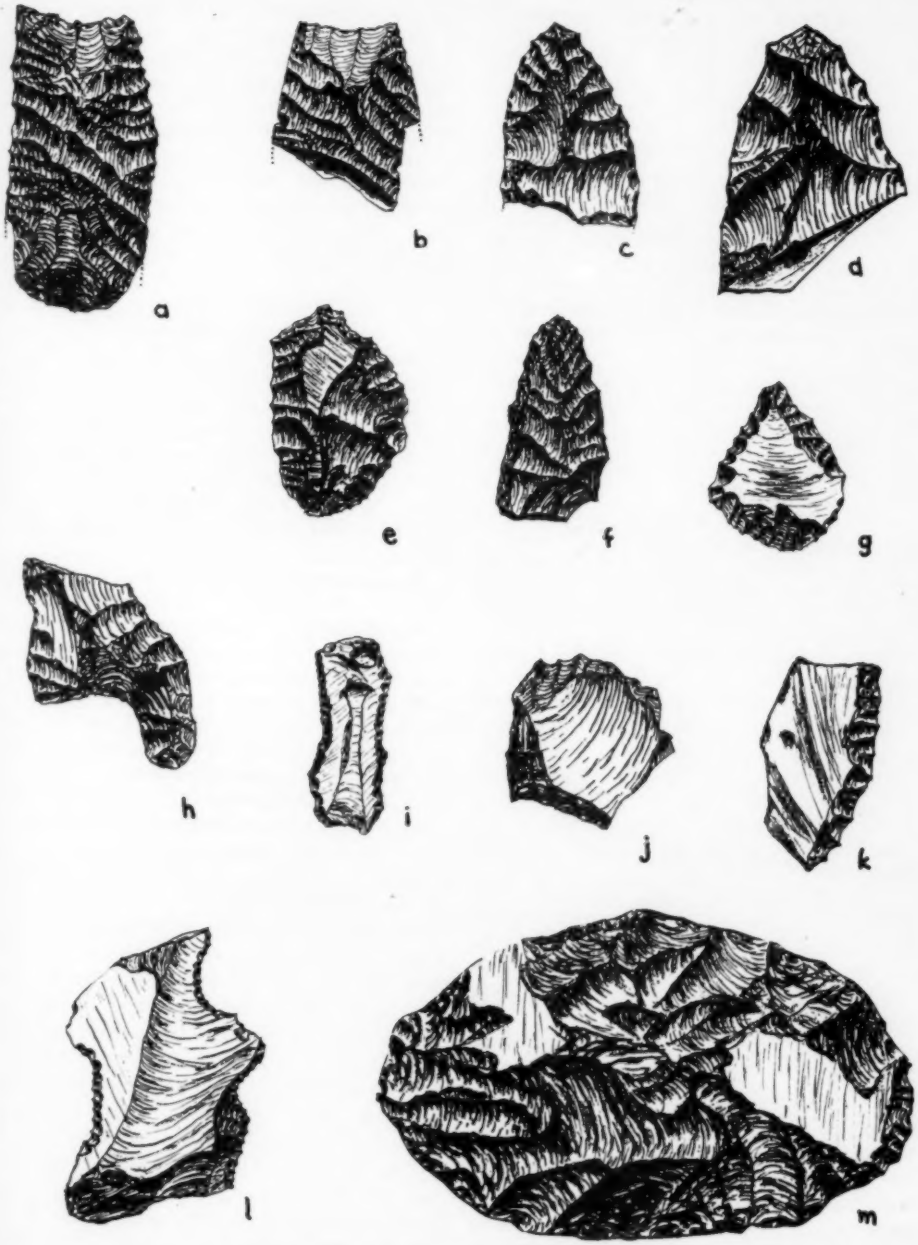

FIG. 68. Chipped stone artifacts from the same site as those in Figure 67.

2. *Combination Side and End Scrapers.* These differ from the preceding form only in that the retouching extends around one corner of the flake so that all of one side and one end are flaked. The range of dimensions is: length 3.1 to 1.2 cm.; width 2.1 to .6 cm.; thickness .6 to .1 cm. Of the 10 specimens 1 is from the surface, and the remainder from the house.

3. *Notched Scrapers.* In these specimens retouching is partially or completely confined to a semicircular notch in the edge of the flake. Perhaps they were used for trimming wooden shafts, which were placed in the notch. The range of dimensions is: length 4.2 to 1.8 cm.; width 3.7 to 1.4 cm.; thickness .4 to .2 cm. Of the 14 specimens 1 came from the surface, 7 from the house, 3 from the mixed zone immediately below the floor, and 3 from definitely below the house floor (Fig. 68, *l*).

4. *Circular Scrapers.* Included here are flakes roughly circular in form, retouched along 50% or more of their edge. The average diameter is 2.4 cm.; the average thickness .5 cm. Of the 7 specimens, 1 was from the surface, 3 were from the house, and 3 from definitely below the floor (Fig. 68, *j*).

5. *Elongate Scrapers, with both sides retouched.* The range of dimensions is: length 5.5 to 2.1 cm.; width 2.5 to 1.1 cm.; thickness 1.1 to .1 cm. Of the 14 specimens 1 was from the surface, 11 were from the house, and 2 from the mixed zone immediately below the house floor (Fig. 68, *i*).

6. *Irregular Scrapers.* These are irregular flakes retouched on 2 or more edges. Of the 8 specimens, 7 were from the house and 1 from the mixed zone immediately below the floor.

The profusion of flake scrapers indicates that most were manufactured for use on a single job and then discarded. The quantity of obsidian at the site made this wasteful procedure possible.

A single large, sharp-edged flake of dense, fine-grained, dark gray, igneous rock was recovered from the surface of the site. The flake was brought to the site by man, and shows evidence that it was struck off from a larger stone by human agency. It has not been retouched but it could have served admirably either as a knife or scraper. Its dimensions are 14.3 by 5.38 by 1.66 cm.

Ground stone artifacts were rare at Vermilion Valley 1. Three articles of worked steatite were the only such specimens. A single sherd from a steatite bowl was found in the house pit. It is a carefully finished rim fragment. The rim is incurving, rounded and undecorated. The most reasonable reconstruction of the vessel from which it came is a deep globular bowl with a maximum diameter of around 12 cm. and a mouth diameter of around 7 cm. The thickness ranges from 1.0 cm. to .7 cm. The presence of a steatite vessel at the site furnishes further evidence that its inhabitants were Western Mono rather than Owens Valley Paiute, as steatite vessels were of importance to the Western Mono and Foothill Yokuts but are not mentioned for the Owens Valley Paiute and did not occur at Iny-2 (Gifford 1932: 25; Gayton 1948b: 266; Fenenga 1952: 344; Steward 1933; Riddell, H. 1951).

Two flat, disk-shaped beads of steatite were found on the surface. Their dimensions are: diameter .90 and .94 cm.; thickness .30 and .20 cm.; perforation diameters .30 to .20 cm. and .21 to .20 cm. Both are conically drilled. They are identical to the 6 beads recovered at Slick Rock Village and the 145 found at Iny-2 (Fenenga 1952: 345; Riddell, H. 1951: 16-17, 25). This artifact type is regarded as diagnostic of the protohistoric period (Fenenga 1952: 345).

The remaining stone artifacts are those modified by use only, and are mainly grinding tools.

No portable mortars were encountered. There are 2 areas of bedrock mortars at the site and a third 90 yards to the north, altogether with 22 mortar holes, only 2 of which are deeper than 3 inches. Mortar holes are said to have been used for acorns until they attained a depth of 3 inches, after which they were used for hard, nonoily seeds (Gifford 1932: 124). Several pestles were observed at the bedrock mortar areas, and were measured but not collected. These are merely elongate, granite, stream cobbles.

Six manos, fragmentary or complete, were recovered, 4 from the surface and 2 from the house floor. All are stream cobbles ground smooth on one surface, or in one instance on both surfaces. They are of a size which fits well within one hand. Five are of granite, while one is of a pumice-like rock which must have been imported. No portable metates were found but there were several areas of bedrock which would have served as the lower surface of a hand mill. This condition agrees with the findings at Iny-2 (Riddell, H. 1951: 162). Among the Northfork Mono, the mano and metate was used to grind small hard seeds (Gifford 1932: 124).

A granite cobble from immediately below the house floor appears to have seen use as a hammerstone.

Twenty-two potsherds were recovered from Vermilion Valley 1. Eighteen are from the surface and 4 from the house pit. Examination of the sherds shows that they fall into the range of Owens Valley Brown ware (Riddell, H. 1951: 20-1). A brief description of the specimens is given below.

Construction: coiling, thinned by scraping.

Fired: oxidized, with a poorly controlled atmosphere.

Core color: variable, ranges from shades of reddish brown, brown to black.

Surface color: exterior, ranges from reddish brown to black; interior, ranges from light gray to black.

Temper: very fine to large rounded quartz sand; occasional mica; temper descriptions in the literature often refer to "decomposed granite," that is, quartz sand and mica, with the clay washed away.

Texture core: fine to coarse.

Walls: medium strong.

Surface finish: scraped; exterior generally has vertical and/or diagonal striations; exterior never has even surface, often lumpy; interior, most often horizontal striations.

Thickness of walls: .40 to .65 cm.

Rims: variable and uneven.

Comparison: Vermilion Valley 1 potsherds are similar in all respects with the type specimens of Owens Valley Brown ware in the collections of the University of California Museum of Anthropology.

Remarks: there is no difference between the potsherds from the surface, and those from the house pit.

An increasing amount of survey and excavation is being carried on in that area on the eastern and western slopes of the Sierra, which was the territory of the historic Foothill Yokuts, Western Mono, and Owens Valley Paiute. This work has disclosed that pottery is widespread over most of the region. A number of separate descriptions of this ware, both ethnographical and archaeological, have been published (Gayton 1929; Steward 1933; Lathrap and Meighan 1951; Riddell, H. 1951; Fenenga 1952), and it seems timely to consolidate the available information. The collections of the University of California Museum of Anthropology, the type collection from Iny-2, and the description of Owens Valley Brown ware (Riddell 1951), form the basis of the discussion. It will be demonstrated that all the indigenous pottery from the area under discussion is, in fact, Owens Valley Brown ware.

Some 34 ethnographic specimens (whole vessels) including Yokuts, Western Mono, and Owens Valley Paiute, from Tulare, Kern, Fresno, Inyo, and Mono counties respectively, were studied in detail. All are sufficiently similar to the type collection to be classified as Owens Valley Brown ware. Construction is by coiling, with thinning by scraping; firing is in a poorly controlled oxidizing atmosphere; temper, where possible to determine without damaging vessel, ranges from fine to coarse; core color is variable, reds through browns; most exterior surfaces exhibit vertical or diagonal lines, which are sometimes deep, almost grooves; the shiny appearance of a few vessels may be due to the use of steatite powder (Gayton 1929: 243); interiors almost always show horizontal scraping marks; occasionally exteriors and interiors are smooth, exhibiting no striations, having been smoothed by the fingers, a trait also known ethnographically (Gayton 1929: 243; Steward 1933: 267); vessel and rim shapes are more varied than those mentioned for Iny-2 (Riddell, H. 1951), but this is to be expected as the sample of reconstructed vessels from the site was small; bottoms were molded by hand; bowls predominate; fingernail indentation is sometimes present, usually in parallel rows down the side of the vessel; there is no slip of paint. The study of this material augments the description of Yokuts and Western Mono pottery (Gayton 1929).

The following archaeological material was examined: potsherds collected in Mono County during the summer of 1953 by a survey party (Meighan, C. W., 1953, unpublished fieldwork); several hundred potsherds from the surface and from excavation of several sites in the Pine Flat Reservoir area of Fresno County (Fenenga, F. and Riddell, F. A., 1948, unpublished fieldwork); a smaller number of sherds from the surface of several sites in the Isabella Reservoir area, Kern County (Fenenga, F. and Riddell, F. A., 1948, unpublished fieldwork); a surface collection of potsherds from four Inyo County sites (Meighan, C. W. and Baumhoff, M. A., 1951, unpublished fieldwork). All of these specimens conformed, without significant deviation, to the published description of Owens Valley Brown ware (Riddell, H. 1951: 20-1). The same correspondence

exists in the case of the description of some archaeological Panamint Mountain pottery (Lathrap and Meighan 1951: 21-3), and the ethnographic description of the Owens Valley Paiute pottery (Steward 1933: 266-9).

In the Slick Rock Village report (Fenenga 1952: 343-4) the name "Tulare Plain" has been given to the pottery. Judged from the published description, Tulare Plain, aside from one feature which is assumed to be incorrect, appears in no way different from Owens Valley Brown Ware. By right of first publication (Colton and Hargrave 1937: 19) the name Owens Valley Brown ware has the priority and it is here recommended that the term "Tulare Plain" be discontinued. It is the statement that "Tulare Plain's" walls were thinned by paddle and anvil which seems to be in error. Slick Rock Village lies between the Kern River and Pine Flat area, as noted above. No evidence of the use of paddle and anvil was found in the sherd collections from these two areas. If "Tulare Plain" was thinned by paddle and anvil, it is a localized variant.

In summary, a comparison of the pottery in the University of California Museum of Anthropology from the areas formerly inhabited by the Yokuts, Western Mono, and Owens Valley Paiute, with type specimens of Owens Valley Brown ware, and with descriptions in the literature, indicates that the basic pottery of this entire area is Owens Valley Brown ware. However, when more work has been carried on in this region, and there is a larger sample of whole vessels, rims, and decorated sherds, local variations may become apparent. The Owens Valley area perhaps was the dispersal center of the knowledge of making this ware to the other areas where this pottery is made. It is known that the Paiute intermarried, especially with the Western Mono, their cultural and linguistic kin, and this may have been the mechanism whereby pottery passed from one group to the other. The fact that the Western Mono and the Foothill Yokuts are the westernmost California Indians to make functional pottery vessels and abut to the north and west on peoples without pottery adds support to this hypothesis.

The 6 glass trade beads recovered from the house pit are of interest in that they suggest a terminal date for occupation at the site. There are 4 types represented in the collection:

Globular, with transparent red exterior and opaque, white core; 2 specimens, dimensions: length .27 and .24 cm., diameter .39 and .38 cm., perforation .09 and .09 cm.

Subcylindrical, with opaque, red exterior and transparent, dark green core; 2 specimens, dimensions: length .46 and .65 cm., diameter .52 and .73 cm., perforation .19 and .29 cm.

Globular, opaque white; 1 specimen, dimensions: length .28 cm., diameter .38 cm., perforation .08 cm.

Globular, transparent, medium blue; 1 specimen, dimensions: length .25 cm., diameter .35 cm., perforation .05 cm.

The first 3 types are Meighan's types 99, 104, and 184 respectively. The blue seed bead is intermediate between Meighan's types 213 and 200 (Meighan, n.d.). These bead types occur elsewhere, mainly in the Mother Lode region of California, the latest sites in the Sacramento Valley, and the McCloud River area in northern California. They are absent at sites which were under only Spanish or Mexican influence (Meighan, n.d.). These factors indicate a date which is certainly post-1830 and probably post-1848. Furthermore, 2 of these bead types are shared with 2 burials in an historic Yokuts cemetery. These burials have been dated as falling in the 1830-1860 period (Riddell, F. 1951: 8-10, 23-4).

Six fragments of bottle glass were associated with the house pit. Five, probably all from the same bottle, are thin, .1 to .2 cm. thick, and of a greenish-brown color. The remaining piece is of thick, .5 cm., uncolored glass. Its edges are somewhat modified, a condition which suggests that it may have been used as a scraper.

Summary and Conclusions. It is possible that Vermilion Valley 1 is culturally stratified, but a much larger sample of the deeper layers would be necessary to demonstrate this possibility. It is evident that most, if not all of the artifacts from the house pit are derived from the occupation of the house, and that the fill in the pit represents natural wash after the total abandonment of the site rather than subsequent occupation. That artifacts were churned into the sand a short distance below the original excavation of the floor also seems likely.

The cultural remains from Vermilion Valley 1 present a fairly satisfactory picture of the terminal phase of aboriginal occupation in this section of the High Sierra. The house may

have been occupied well past 1850. The combined ethnographic and archaeological evidence leads to the conclusion that its owners were Western Mono, possibly of the Posgisa group. It is probable that the Owens Valley Paiute also occasionally camped here to trade with the Western Mono. The collection from Vermilion Valley 1 is similar to those secured at Slick Rock Village, a Yokuts site bordering on Western Mono territory and at Iny-2, an Owens Valley Paiute winter camp. The overall similarity is slightly greater between Vermilion Valley 1 and Iny-2, but this is chiefly a function of the abundance of points at the 2 sites. The scarcity of pottery at Vermilion Valley 1 as compared with the other 2 sites evidently indicates that the Indians were unwilling to carry very much of that bulky and fragile commodity on their backs into the High Sierra. The absence of bone awls at Vermilion Valley contrasts with their abundance at Slick Rock Village (Fenenga 1952: 344-5). This perhaps can be explained for the same reason. The Indian women may not have cared to carry in the bulky raw materials necessary for making coiled baskets, an operation for which these tools were presumably designed. On the other hand the absence may be apparent rather than real and due to the poor preservation of bone at the site. The number of points recovered from the single house is unusual, particularly when compared to the scarcity of this class of artifact at Slick Rock Village (Fenenga 1952: 344). It might be suggested that here was the house of a professional point maker, a not unreasonable hypothesis, since the Western Mono received raw obsidian and blanks from the Owens Valley Paiute, and traded finished arrowheads to the Yokuts (Gayton 1948b: 261).

The excavated house does not appear to have been a temporary shelter. It was instead, a large, solidly-built, summer residence to which its owners returned year after year. The amount of ash in the hearth is great for a California Indian house. In order to maintain a residence at this altitude for a period of several months, the Indians must have carried in many pounds of acorns and pine nuts, and the presence of well-worn mortar holes at the site confirms that they did. This transporting of food is recorded ethnographically and was done by the women (Gifford 1932: 19).

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Museum of Anthropology
University of California
Berkeley, Calif.
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A PIT HOUSE SITE NEAR SANTA ANA PUEBLO, NEW MEXICO

J. W. Allen and C. H. McNutt

ONE OF THE greatest problems confronting southwestern archaeology in its aim of interpretive reconstruction of the cultures of prehistoric peoples lies in filling the gaps where little or no information exists concerning significant periods of development in particular areas. One such interval, of considerable duration, exists in the middle Rio Grande Valley.

We have known for some time that this region was inhabited by some of the early hunting groups (Hibben 1941, 1951) as well as the later Pueblo peoples. But who the people were, if any, that lived here during the interim between these extremes has been, until recently, largely a matter for conjecture. No ecologic reason has been presented to show why this river valley could not have supported its share of inhabitants, whether hunters, gatherers, or agriculturalists, during these thousands of years.

On the positive side, there is scattered evidence indicating the presence of at least some groups in the area during this time. Nonceramic sites of a culture broadly similar to that of the Cochise gatherers of southern Arizona and New Mexico have been reported recently (Campbell and Ellis 1952; Agogino and Hester 1953). Mera, as long ago as 1935, reported the occurrence of early types of pottery in the area (Mera 1935: 2, 25 *ff.*). At some of these sites test trenches were dug, but as yet no detailed information has been presented regarding the derivation, architecture, or typical artifact assemblages of the makers of these wares.

For some time the authors have known of one such early sherd site near the old Santa Ana Pueblo. Careful searches of this area failed to reveal any evidence of architectural

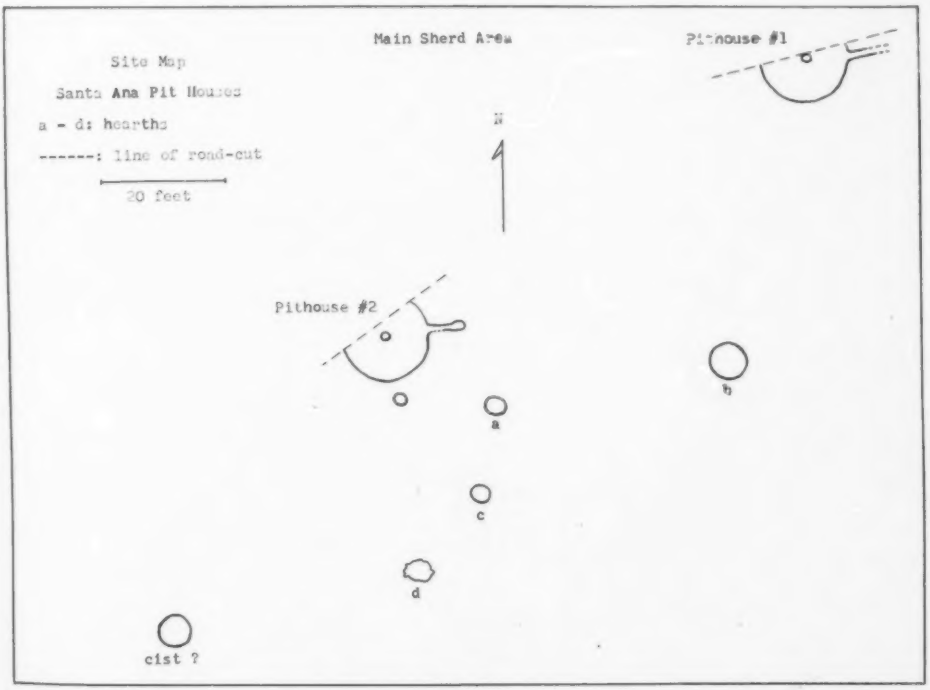

Fig. 69.

remains or occupation refuse. This led to the supposition that architecture, if present during the occupation of this site, was of "jacal" or some other type which disappeared without leaving traces.

Last year it became known that the U.S. Army Engineers were to construct a new road to the old pueblo of Santa Ana in conjunction with the Jemez Dam Project. This road was to cross a portion of the site mentioned. The authors spoke to Donald Wilson, Project Engineer at the dam, and to James Coombes, road supervisor, about the site and asked that careful watch be kept during their operations in case any indications of occupation might be found. Late in April, Wilson informed us that the road crew had encountered charcoal lenses at a considerable depth below the present surface. Investigation indicated two pit houses in cross section, in the face of cuts made by road equipment. Excavation began as soon as possible, with the continued and most helpful cooperation of Wilson and Coombes. The project was carried out under the supervision of Florence H. Ellis of the University of New Mexico, and with the cooperation of the National Park Service. Also, thanks go to Phoebe Russell for preparing the final manuscript.

Site Description and Excavation Techniques. The site is located just to the east of the new road from New Mexico Highway 44 to Santa Ana Pueblo, some .4 mile from Highway 44. It is barely a mile north of the nonceramic hearths reported upon by Agogino and Hester. Broken pottery was scattered over an area of several hundred square yards. Other evidence of occupation was found, such as metates and manos of general pueblo types, chips of chert

FIG. 70. Pit house 1 before excavation, looking southeast.

and obsidian, and circular and oval hearths ringed by fire blackened river pebbles. The sherd area is concentrated on the slopes of an old terrace of Jemez River, in many cases extending well onto the top of this terrace.

At present this region is marked by sand hills with very sparse vegetation. In the immediate area of the pit houses this sand, containing a few thin layers of water-deposited clay, is found to a depth of at least 10 feet below the present surface. The dwellings of this site originally were dug into this sand, and later filled with the same material.

In the faces of the road cuts the floors of the houses were clearly defined by a considerable amount of charcoal from a roof-fall of burned material (Fig. 70). The upward curvature of walls was defined for about one foot above floor level by the burned wood and discolored sand which lay against the wall face.

Above the floors of the pit houses there were 8 to 9 feet of sand and clay layers; only the lower 2 feet showed signs of discoloration and charcoal. After ascertaining the cultural sterility of the overburden, a bulldozer, obligingly loaned by the Army Engineers, was employed to remove the sand to within 2 feet above floor level, the depth at which the blade first struck charcoal. The rest of the excavation was carried out by standard techniques.

At no time in the course of further road operations or of our own investigation was a pottery- or artifact-bearing level found in the fill.

Hearths. Surface hearths have been mentioned. Among the stones used to line them there were several bifacial one-hand manos. These manos, as well as other types, can be found in the sherd area today and are of little assistance in determining the cultural affiliations or age of these open fireplaces. The hearths contained no other artifacts.

During the road-work operations 5 roughly circular hearths or cists were uncovered in the area south of the pit houses (Fig. 69). They occurred at different levels in the fill. They were outlined only by discolored sand; diameters varied from 2 feet 2 inches to 5 feet, depths varied from 5 inches to 2 feet 1 inch. Hearth "b" contained several chips of chert, 2 mano fragments, and a serrated, stemmed point of obsidian (Fig. 71, *b*). No sherds were found in any of the hearths; with the exception just mentioned, they contained no artifacts whatsoever.

Pit House 1 (see Fig. 72).

Pit walls: discernible to about 1′ above floor level, sloping slightly outward; unplastered except in vicinity of entry and step.

Floor: circular, dia. 14′; of unplastered, hard-packed sand; sloped upward at periphery to meet walls; best defined in vicinity of step, ash pit, and fireplace; single flat stone imbedded in floor at base of step, with upper surface at floor level.

Floor depression: (D); 5″ dia., 2″ deep; no contents other than discolored fill.

Fireplace: formed by raised, well-plastered ring 3″ high; interior plastered; external dia. 2′ 6″, internal dia. 1′; did not extend below floor level; 4 concavities, presumably pot rests, on rim of fireplace, equally spaced with 2 in line of main axis of entry passage.

Ash pit: circular, 9″ dia., 6″ deep, 1′ 11″ east of fireplace; edges plastered at floor level; contained only fine white ash.

Postholes: (P); burned upright remains of posts found at P1 and P2 with burned and rotted remains to 1′ below floor; both apparently main roof supports; P1: double post, each member about 2½″ dia.; P2: single post, 5½″ dia.; a small bit of unworked turquoise was found at the bottom of P2.

Step: single step from house interior up into entry passage; top and face well plastered; 9½″ high, 1′ 3″ wide; face of step projected 4″ inside wall line.

Entry: lateral passage on east of house, continuing from top of step; floor slightly troughed; parallel vertical walls 4″ high; passage 1′ 3″ wide, 8′ 6″ long, sloping uniformly upward (ca. 6″) toward far end; cracked plaster on floor and to lesser extent on walls from proximal end to distance of 2′ 8″ from step; all distal outlines of entry could not be detected.

Superstructure: probably 4 main roof supports with crossbeams used to support secondary posts from outside wall periphery; remains of burned twigs and brush in fill presumably roofing and wall material.

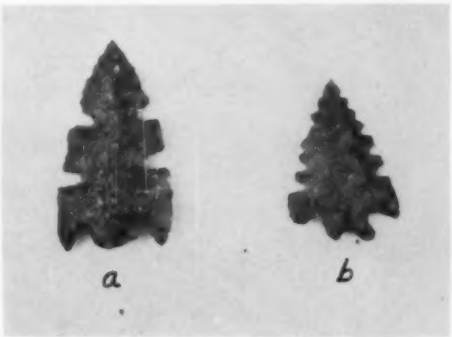

FIG. 71. *a*. Obsidian point from pit house 2, base missing, length 3.9 cm. *b*. Obsidian point from hearth *b*, length 3.1 cm.

Pit House 2 (see Fig. 73).

Pit walls: discernible to about 1′ 2″ above floor level; unplastered, sloped slightly outward; outline irregular in area marked "B."

Floor: circular, dia. 13′; unplastered packed sand, sloped upward at periphery to meet walls; poorly defined except for section to west of fireplace; 1 river pebble found at "R," significance questionable.

Fireplace: formed by raised plastered ring 3″ high; interior plastered; external dia. 1′ 11″, internal dia. 11″; did not extend below floor level; rim uneven and in poor condition.

Ash pits: (A); 3 possible ash pits. (A1-3); A1: circular, 8″ dia., 1″ deep, covered and filled with fine white ash, located 1′ east of fireplace; A2: circular, 7″ dia., 11″ deep, filled with sand and fine charcoal, no ash; A3: circular, 7″ dia., 11″ deep, filled with sand and fine charcoal, contained one red/brown sherd.

Postholes: (P,p); 10 found, 4 interior (P1-4), 6 smaller exterior (p1-6); with exception of P1, post positions marked only by discolored sand and small bits of charcoal; P1, burned upright remains of single post 4″ dia., charcoal traced to 10″ below floor.

Step: single step from house interior up into entry passage; plaster doubtful; 3″ high, 1′ 3″ wide; lump of adobe found centered on top of step near edge, has appearance of double handful of clay dropped when moist; at north edge of adobe stone roughly 3″ dia., 1½″ thick, set into top of step and embedded in matrix of adobe.

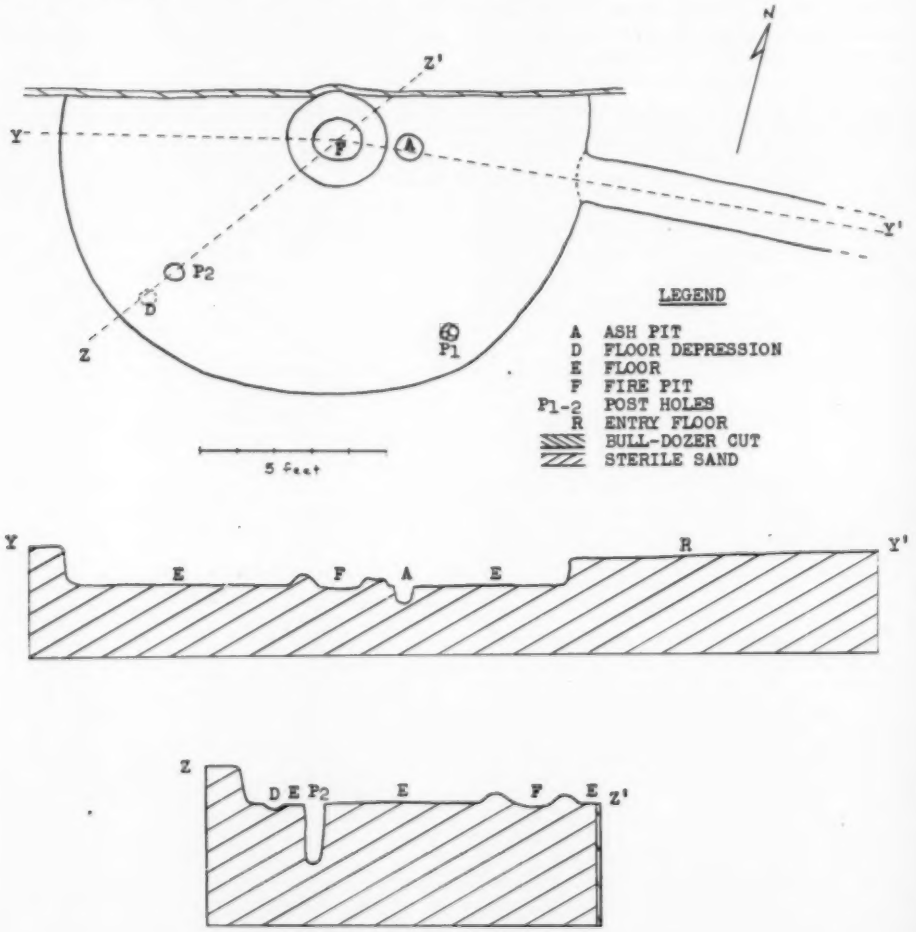

Fig. 72. Pit house 1, plan and sections.

Entry: lateral passage on east of house, continuing from top of step; floor troughed, with nearly semicircular cross section; bulbous distal end; no vertical walls; passage 1′ 3″ wide, 7′ long, sloping uniformly upward (ca. 5″) toward far end; bulbous section 2′ across; no plaster.

Cist: outside pit walls, opposite beam material at "B"; circular, 2′ 1″ dia., 11″ deep; contained burned brush and sand.

Superstructure: probably 4 main roof supports with crossbeams used to support secondary posts from outside wall periphery; remains of burned twigs and brush in fill presumably roofing and wall material.

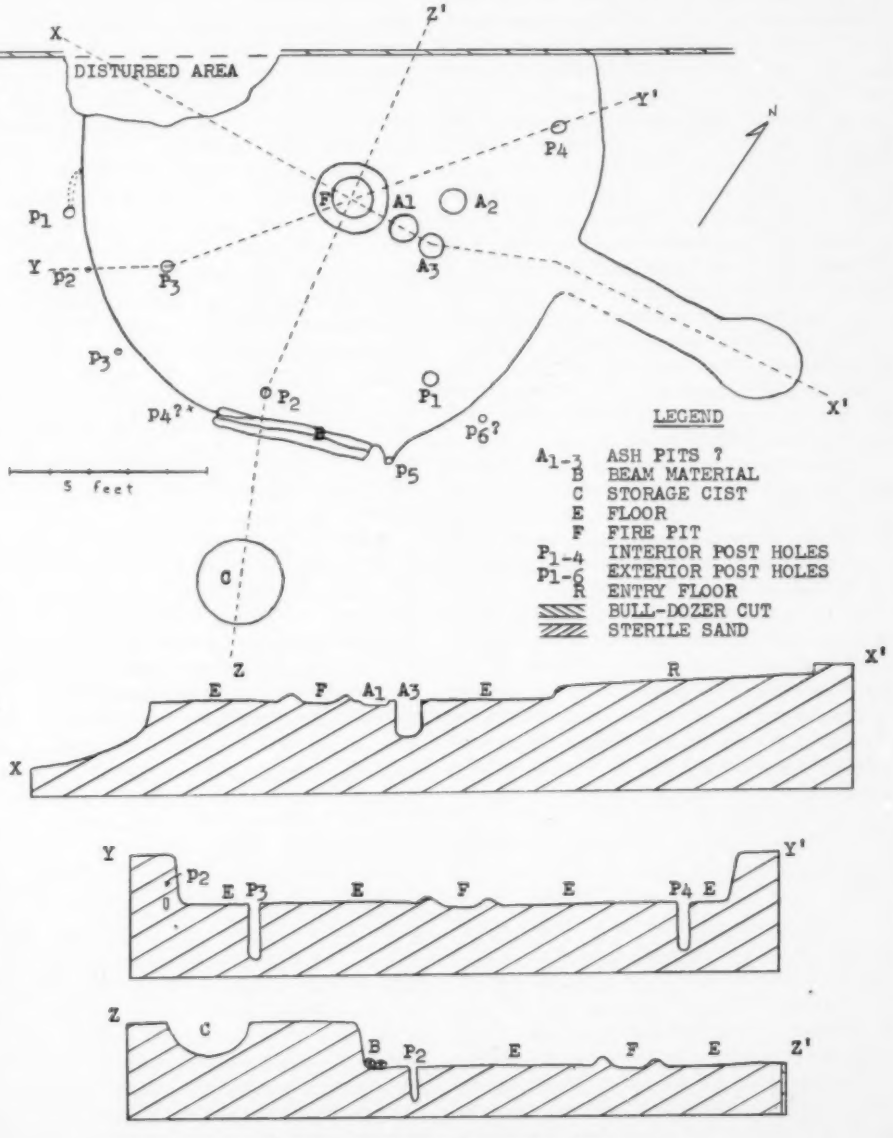

FIG. 73. Pit house 2, plan and sections.

Discussion of Architecture. Since the pit houses were discovered in the sides of cuts made by earth-moving machinery, the entire floor outline of neither remained, but their original shape was apparently circular.

An indication of the original depth to which the houses had been dug was found in the face of the cuts, where fine layers of clay and minute lines of charcoal could be traced above, and generally parallel to, the floors of the houses. These lenses, which occurred as close as 3 feet above the floors, extended evenly across the wall planes, and must have been deposited after the houses had been abandoned.

There was a marked similarity between the 2 houses. They were of nearly the same size, both had floors of hard-packed sand showing incidental areas of plaster, and both had been dug into native sand with very little plaster or other wall reinforcement apparent. Both had long, narrow entry passages on the east side of the house. These passages sloped uniformly and gradually downward toward the pit interior, and terminated in a step descending to the floor at the point where the entry intersected the wall line.

Interior features common to both houses were centrally located fireplaces outlined by slightly oval, raised, plastered rims; ash pits to the east of the fireplaces; and roof supports apparently placed in the pattern of a standard 4-post and crossbeam structure.

Inasmuch as both houses were partially destroyed, some justification of the assumption of a 4-post construction must be given. In the first house only 2 postholes remained, and the 4-post pattern was assumed on the basis of symmetry. In the second house, which was somewhat more complete, 4 postholes were found, only 3 of which fell into the 4-post pattern. The fourth post (P2 in Fig. 73) occurred near a sizable amount of beam material found on the southern edge of the house. The authors feel that this beam material may possibly represent remains of a lintel which braced a passage or means of access from the interior of the house to a cist lying just outside the pit walls. If this is so, the post at P2 was not connected with roof support at all. There is also the possibility that this post was merely a secondary brace for one of the main beams.

Secondary posts just outside the wall periphery were found in one house, but not in the other. Where these posts were found they left only slight traces.

Slight differences did occur in features common to both houses. In the first house 4 depressions were found equally spaced about the rim of the fireplace. They would have served well as pot rests. In conjunction with this fireplace was a single ash pit. In the second house the fireplace rim was poorly preserved, and it was impossible to ascertain whether or not rim depressions had been present. There were 3 possible ash pits in conjunction with this fireplace, the one nearest the fireplace being much shallower than the others.

Certain negative evidence should be presented in order to stress the absence of features frequently found in pit houses of surrounding areas. It has already been pointed out that no heavy plaster or stone slabs were used in the construction, and that interior floor depressions were found in only one case. This is more characteristic of southern than northern houses (Haury 1940: 50, 52). No partition walls or floor ridges joined the fireplaces; no sipapu or deflectors were found. Whereas the floors were somewhat uneven, no indication of 2 distinct levels was found. No ladder depressions occurred.

In summary, the authors feel that they can present a pit house "type" as representative of this site. The advisability of presenting any type based on but 2 specimens may well be questioned, but the similarities seem to warrant it in this case. The house type is characterized by shallow pits with circular floor plans, long, narrow entry passages sloping slightly downward to join the house on its east side, and a single plastered step down from the entry into the house interior. Only slight use is made of plaster or any imperishable building material in wall, entry, or floor construction. Interior features are simple: a centrally located fireplace outlined by a raised, well-plastered circular rim, and one or more ash pits located about 1 foot to the east of the fireplace. Floor depressions are rare; partition walls, deflectors, sipapus, and subfloor cists are absent. Wall storage niches may or may not be present. The superstructure was probably composed of 4 main upright supports with crossbeams used to support secondary posts set outside the wall periphery and just below floor level.

In order to discuss the primary architectural affiliations of the two pit houses excavated near Santa Ana it will be convenient to treat certain features individually, inasmuch as some of these are at present considered typical of the northern, or Anasazi, area, and others are considered typical of the Mogollon areas to the south.

Circular pit houses with long lateral entries are found at the following sites:

Site	Phase	Postulated Date
Mogollon Village (Haury 1936: 12; see also 54 for similar houses in Harris Village)	Georgetown	A.D. 500-700
Starkweather Ruin (Nesbit 1938: 10, type I houses)	Georgetown	A.D. 500-700
Bear Ruin (Haury 1940: 49)	Forestdale	A.D. 600-800
Shabikeschee Village (Roberts 1929: Fig 21)	B. M. III	?
Ackmen Lowry, site 1 (Martin and Rinaldo 1939: 342, 346)	B. M. III	A.D. 750-850

A southern priority is indicated by the dates given, although the time span shown is not great. It is interesting to note that the southern houses are usually oriented to the east, whereas the houses of the 2 northern sites are oriented mainly toward the south. The northern examples are not typical of the sites at which they are found, and their lateral entries were later remodeled into ventilator shafts. The Georgetown phase houses were characterized by steeply slanting entries, whereas the entries at Bear Ruin rose at a gentler slope. Hence the Santa Ana pit houses appear to have their closest parallels in shape, entry method, and orientation in sites to the south and west. The closest parallels are found at Bear Ruin in the Forestdale Valley of Arizona (Haury 1940. See house 9, Fig. 13; 11, Fig. 15; 12, Fig. 16).

Long lateral entries, but in association with rectangular house outlines, are found in other southern sites. They are typical of the San Francisco and Three Circle phases of the Mogollon culture (Haury 1936: 62; Martin and Rinaldo 1950: 389), and are also typical of the early Mogollon (presumably Circle Prairie phase) structures in the Point of Pines region of Arizona (Wheat 1950: 17-18).

Centrally located fireplaces with raised plastered rims appear in the north with considerable frequency, and may be said to be typical of the Anasazi area (Haury 1940: 48, 56). Centrally located fireplaces, lacking raised rims, occur in the Forestdale Phase at Bear Ruin, but such fireplaces are not typical of earlier pit houses of the Forestdale area (Haury and Sayles 1947: 44). A single rimmed hearth was found in Bear Ruin (Haury 1940: 52). They occur even less frequently in more southern areas, although they are found complete with raised rims in at least one early Mogollon site in the Point of Pines region (Wheat 1950: 18).

Although it is fairly certain that the fireplaces at Santa Ana represent Anasazi influence, one further comment must be made regarding these northern fireplaces. Until approximately A.D. 900 these were almost always built in conjunction with a fairly constant complex consisting of a rimmed hearth, floor partitions or ridges, ash pits, sipapu, and a 4-post roof support (Haury 1940: 52). In the late 800's this complex apparently began to degenerate (Roberts 1931: Figs. 1, 5, 7; Roberts 1939: 47, 63, 74, 255). The absence of this complete complex at Santa Ana hints at 2 possibilities: either 1) the people of the Santa Ana pit houses adopted the northern style of fireplace, but did not adopt the winged hearth and sipapu complex, which may have had religious connotation, or 2) the houses at Santa Ana are representative of a further degeneration of this same complex. We favor the first possibility, as the second is contradicted somewhat by ceramic evidence from the site.

Ash pits have been noted in connection with the winged hearth and sipapu complex of the north; they are not common in the south. Remarks made in discussing a qualified northern connection of the rimmed fireplaces would also apply to the presence of ash pits.

A 4-post roof support has been considered as a northern characteristic (Haury 1940: 56), but the number of occurrences in the Mogollon area (Haury 1940: 51; Haury and Sayles 1947: Figs. 5, 14; Nesbitt 1938: 32; Wheat 1950: 18) is sufficient to lead the authors to consider this trait inferior to such features as rimmed hearths, sipapus, etc., in demonstrating Anasazi influences.

The single step is found at several southern sites (Martin and Rinaldo 1947: Map 31; Martin and Rinaldo 1950: Figs. 91, 95, 97, etc.; Haury 1936: Fig. 25; Haury 1940: Figs. 6, 7, 11), but it can hardly be said to be typical of any particular area. It occurs most frequently in the Pinelawn Valley area (Haury, 1936: [Mogollon Village]; Martin and Rinaldo, 1950: [Turkey Foot Ridge]).

The Santa Ana pit houses are characteristic of neither the Anasazi nor the Mogollon area, but show a marked blending of influences from both regions. In describing the architecture at Bear Ruin, Haury infers that the benches, southern ventilating ducts, coping surrounding hearths, floor ridges, postulated roof entrances, and 4-post roof supports are essentially Anasazi in nature (Haury 1940: 48). It must be noted that these characteristics, with the exception of the roof support plan, are not typical of the Bear Ruin houses which are most similar to the Santa Ana examples.

The Santa Ana pit houses would cause little surprise were they to be found in the region between the Bear Ruin and White Mound sites; their appearance in the middle Rio Grande Valley is somewhat unexpected.

Pottery Description. It cannot be emphasized too strongly that the "sherd types" presented below are not "pottery types," but only convenient descriptive categories. Later, with further information from nearby sites, we hope to be able to define valid types and to establish their range and variations.

Surface Collections

I. Plain Wares.

1. Sherd Type: *afinis Lino Gray-A.*

Construction: coiled and scraped; walls 3.5 to 4.5 mm. thick.

Surface Color: majority chalky white; varies to light gray.

Core: light gray, usually with darker central streak; 8 cases of brown cores, probably due to underfiring.

Paste: gray to white; hard and fairly compact; breaks with fairly sharp fracture.

Temper: medium to fairly coarse waterworn quartz sand; quite a few basaltic grains.

Finish: well smoothed and floated; temper shows on surfaces, giving speckled appearance; scraping marks visible on some sherds.

Remarks: these sherds are similar to Kana-a Gray sherds from this site in all features except the actual neck bands of the latter; weathered sherds have a sandy surface texture; one double-fillet handle.

Number and Percentage: 101; 9.8 (percentages are computed on the basis of the total surface collection).

2. Sherd Type: *afinis Lino Gray-B.*

Construction: coiled and scraped; walls 4.0 to 8.0 mm. thick.

Surface Color: majority gray; varies from light tan usually exterior surface only (77 examples), through grays to black (burned).

Core: majority gray, some black.

Paste: gray, fairly hard; breaks with medium fracture.

Temper: fairly coarse to extremely coarse waterworn quartz sand; quite a few basaltic grains.

Finish: fairly well smoothed and floated; considerable temper protrudes through both surfaces; scraping marks usually visible under 10X glass.

Remarks: several sherds of this type show fugitive red paint; 2 conical lugs found; sherds with tan surfaces tend to merge with sherd type Lino Gray-D, but the brown of the latter is considerably more intense.

Number and Percentage: 399; 38.8.

3. Sherd Type: *afinis Lino Gray-C.*

Construction: coiled and smoothed; walls 4.0 to 5.0 mm. thick.

Surface Color: majority light tan; varies to light gray.

Core: gray, outer portions sometimes tan.

Paste: gray; breaks with crumbly to medium fracture.

Temper: fine waterworn quartz sand; contains basaltic and occasional reddish grains.

Finish: very evenly smoothed, many sherds polished to dull luster; temper shows on surfaces as fine specks.

Remarks: interiors often rough or scaled off; this group tends to merge with sherd type afinis Woodruff Brown-A, but latter appears to have been fired in more strongly oxidizing atmosphere.

Number and Percentage: 109; 10.6.

4. Sherd Type: *afinis Lino Gray-D.*

Construction: coiled and smoothed; walls 4.0 to 7.0 mm. thick.

Surface Color: interior light gray; exterior usually chocolate brown, varies to tan.

Core: gray, varies to tan with gray central streak.

Paste: gray to tan, hard; breaks with medium to fairly sharp fracture.

Temper: coarse to extremely coarse waterworn quartz sand; some basaltic grains.

Finish: exteriors well smoothed and floated, some possibly polished; interiors show scraping marks and less floating; temper protrudes through both surfaces.

Remarks: similar to afinis Lino Gray-B, but has brown exterior, apparently due to firing technic; not all from same vessel.

Number and Percentage: 42; 4.1.

5. Sherd Type: *afinis Lino Gray-E.*

Construction: coiled and scraped; walls 4.0 to 6.0 mm. thick.

Surface Color: one surface, usually exterior, brick red; other surface gray.

Core: gray or black, except for 1.0 to 2.0 mm. adjoining red surface, which is reddish.

Paste: gray; breaks with a crumbly to a sharp fracture.

Temper: fairly coarse to extremely coarse waterworn quartz sand; basaltic grains and inclusions of what appears to be red ocher are present.

Finish: fairly well smoothed and floated; temper protrudes through both surfaces, especially the red surface; some scraping marks visible on gray surfaces.

Remarks: differs from afinis Lino Gray-D in having brick-red surface; some of sherds may be severely weathered Tamaya Red; all sherds not from same vessel.

Number and Percentage: 9; .9.

6. Pottery Type: *Tamaya Red.* (New type.)

Construction: coiled and scraped; walls 4.0 to 8.0 mm. thick.

Surface Color: interior brick red; exterior chocolate brown, varies to tan.

Core: part adjoining interior surface reddish; part adjoining exterior surface tan; some sherds with gray central streaks.

Paste: gray, varies to tan; breaks with crumbly fracture due to excessive use of temper.

Temper: extremely coarse waterworn quartz sand, many grains over 1 mm. in diameter; basaltic grains and inclusions of what appears to be red ocher present.

Finish: fairly well smoothed and floated; a large amount of temper protrudes through both surfaces; surfaces tend to pit; evidence of faint scraping marks on some sherds.

Remarks: the brick-red color on these sherds is very uniform, and apparently was purposefully produced as a decorative color contrast; the red color does not weather, as does fugitive red pigment.

Number and Percentage: 72; 7.0.

7. Sherd Type: *afinis Lino Gray-F.*

Construction: coiled and smoothed; walls 3.0 to 5.0 mm. thick.

Surface Color: reddish brown to chocolate brown.

Core: majority dark gray, varies to brown.

Paste: dark gray, varies to brown; breaks with medium fracture.

Temper: coarse waterworn quartz sand, some basaltic grains.

Finish: smoothed and floated; temper protrudes through both surfaces.

Remarks: in a personal communication (Nov. 4, 1953) E. W. Haury has commented that these sherds are "Lino in all characteristics except color."

Number and Percentage: 42; 4.1.

8. Sherd Type: *afinis Woodruff Brown-A.*

Construction: coiled and smoothed; walls 2.5 to 6.0 mm. thick.

Surface Color: both surfaces usually tan to orange-brown; some examples of grayish interiors.

Core: reddish with gray central streak; varies to completely gray core.

Paste: gray to reddish; breaks with medium fracture.

Temper: fine waterworn quartz sand, numerous basaltic grains.

Finish: very well smoothed; some sherds show marks from polishing stone; temper appears on surfaces as minute black specks.

Remarks: interiors of most rough or scaled off; sherds are similar in paste, temper, and general surface treatment to sherd type afinis Lino Gray-C and also to the single Cerros-Abajo red/brown sherd found in the surface collection; more highly finished than typical Woodruff Brown.

Number and Percentage: 96; 9.3.

9. Sherd Type: *afinis San Francisco Red-A.*

Construction: coiled and smoothed; walls ca. 4.0 mm. thick.

Surface Color: exterior red to tan; interior light tan.

Core: tan with gray central portion.

Paste: gray; breaks with medium fracture.

Temper: fine waterworn quartz sand, with minute opaque, basaltic, and reddish inclusions.

Finish: one side highly polished; other side well smoothed and left with a fine sandy appearance; temper shows on both surfaces as fine specks.

Remarks: these sherds may be true San Francisco Red; the reddish surface is, however, somewhat less intense than that of sample sherds of San Francisco Red; this difference is slight, and there are doubtlessly many sherds of San Francisco Red that are identical in color to the Santa Ana examples.

Number and Percentage: 2; 0.2.

10. Sherd Type: *afinis Alma Plain-A.*

Construction: coiled and smoothed; walls 5.0 to 7.5 mm. thick.

Surface Color: majority a dark gray-brown; varies to reddish brown.

Core: brown to black.

Paste: brown; breaks with crumbly fracture.

Temper: medium to coarse waterworn opaque sand, used liberally.

Finish: smoothed and floated; some sherds show faint scraping marks under 10X glass; temper protudes through both surfaces.

Remarks: differs from Alma series mainly in surface treatment, which is more characteristic of Woodruff series.

Number and Percentage: 15; 1.4.

11. Pottery Type: *Jornada Brown.*

Construction: coiled and smoothed; walls 3.0 to 4.0 mm. thick.

Surface Color: brown to reddish-brown.

Core: brown, varies to dark gray.

Paste: brown to dark gray; breaks with crumbly fracture.

Temper: fine to medium opaque sand with light-colored angular rock inclusions and occasional specks of red ocher(?).

Finish: very well smoothed; a few sherds have a floated surface; temper shows on both surfaces.

Remarks: similar in all respects to sherds in the authors' collection from White Sands Proving Ground, N.M.; temper of latter is slightly coarser.

Number and Percentage: 36; 3.5.

II. Altered Surface Wares.

1. Pottery Type: *Kana-a Gray.*

Construction: coiled and scraped; upper coil lines not obliterated; coils 9.0 to 12.0 mm. wide; walls 4.0 to 6.0 mm. thick.

Surface Color: majority chalky white; varies through gray to black (burned).

Core: light gray; whiter specimens have dark gray central streak.

Paste: gray; breaks with slightly crumbly to sharp fracture.

Temper: medium to coarse waterworn quartz sand; quite a few basaltic grains.

Finish: fairly well to evenly smoothed; floated; temper shows through on both surfaces, giving speckled appearance; some sherds show scraping marks.

Remarks: the whiter sherds of this group are almost identical to majority of sherds described as "afinis Lino Gray-A," with exception of neck bands in this type; although most of these sherds are somewhat lighter in color and better floated than the usual Kana-a Gray specimen, their identity is quite plain.

Number and Percentage: 32; 3.1.

2. Sherd Type: *afinis Alma Neck-banded-A.*

Construction: coiled and scraped; upper coil lines not obliterated; coils 12.0 to 15.0 mm. wide; walls 3.0 to 5.0 mm. thick.

Surface Color: majority brown; varies to tan.

Core: tan, with gray central streak.

Paste: gray; breaks with fairly crumbly to medium fracture.

Temper: fine waterworn quartz sand; some basaltic grains; one sherd with coarse waterworn quartz sand.

Finish: well smoothed on both surfaces; weakly floated; temper protruding through both surfaces; rims slightly pinched.

Number and Percentage: 9; 0.9.

3. Sherd Type: *afinis Alma Neck-banded-B.*

Construction: coiled and scraped; areas between upper coils smoothed by finger run horizontally around neck of vessel, producing ridge, or washboard, effect. ridges 12.0 to 15.0 mm. apart; walls 3.0 to 5.0 mm. thick.

Surface Color: majority tan; varies to orange-brown.

Core: tan to brown.

Paste: brown; breaks with fairly crumbly to medium fracture.

Temper: fine waterworn quartz sand; some basaltic grains.

Finish: well smoothed on both surfaces; weakly floated; temper protrudes through both surfaces; rims slightly pinched.

Remarks: probably all from one vessel; found in small area.

Number and Percentage: 7; 0.7.

4. Sherd Type: *afinis Alma Neck-corrugated-A.*

Construction: coiled and smoothed; upper coil lines not obliterated, but indented orthogonally with thumbnail (?) after coil smoothed onto vessel.

Surface Color: brown, varies to dark brown.

Core: majority black, varies to dark brown.

Paste: brown; breaks with crumbly fracture.

Temper: fine sand with medium crushed rock inclusions.

Finish: well smoothed and exteriors highly floated; temper shows somewhat on both surfaces; some exterior surfaces show faint marks of polishing stone.

Remarks: all sherds probably come from 1 or 2 vessels.

Number and Percentage: 7; 0.7.

III. Painted Wares.

1. Pottery Type: *San Marcial Black-on-white.*

Construction: coiled and smoothed; walls usually 3.0 to 5.0 mm. thick; black mineral paint.

Paste: gray, rough textured; breaks with medium to fairly sharp fracture.

Core: light gray to gray; pronounced dark central streak common.

Temper: fairly coarse to coarse waterworn quartz sand; coarse basaltic grains common.

Finish: scraped and smoothed; some scraping marks visible; most sherds floated, a few possibly slipped; temper shows on both surfaces, especially on non-painted surfaces; painted on 1 side only.

Designs: generally crude; widely spaced hatching and chevrons most common; solid triangles, with and without hooks, common; decoration goes to rims; latter sometimes painted; no evidence of border or horizontal band below rim.

Remarks: no complete vessels found; forms represented apparently bowls (decoration on interior only), jars, and "seed bowls" (exterior decoration); some sherds suggest crude and heavy version of Kiatuthlanna B/W.

Number and Percentage: 49; 4.8.

2. Sherd Type: *afinis Galiuro-Mogollon Red-on-brown.*

Construction: coiled; interior polished, exterior smoothed; walls ca. 4.5 mm. thick; apparently red mineral paint.

Paste: gray, rough textured; breaks with fairly crumbly fracture.

Core: gray, but exterior half brick red.

Temper: coarse waterworn sand; frequent basaltic and reddish grains.

Finish: exterior (brick red) surface smoothed; interior well polished over paint; temper shows on both surfaces, especially exterior; background color light brown.

Designs: wide (ca. 3.0 mm.) parallel lines ca. 8.0 mm. apart.

Number and Percentage: 1; 0.1.

3. Sherd Type: *afinis Cerros-Abajo Red-on-brown.*

Construction: coiled and polished; red paint on interior; walls 4.0 mm. thick.

Paste: gray, fine textured; breaks with medium fracture.

Core: gray.

Temper: medium to fairly coarse waterworn quartz sand; some basaltic and reddish grains.

Finish: polished and floated; temper shows on both surfaces as fine specks.

Designs: paint badly faded; evidently chevron design.

Number and Percentage: 1; 0.1.

4. Pottery Type: *Kana-a Black-on-white.*

Construction: coiled and polished; walls ca. 5.0 mm. thick; black carbon paint.

Paste: gray, medium texture; breaks with medium to fairly sharp fracture.

Core: light gray with darker central portion.

Temper: fairly coarse waterworn quartz sand; a few fine, possibly basaltic, grains.

Finish: polished over paint; possibly slipped, but has appearance of strong float; temper shows through on both surfaces.

Remarks: identification confirmed by E. W. Haury (personal communication, Nov. 4, 1953).

Number and Percentage: 1; 0.1.

PIT HOUSE COLLECTIONS

Since no sherds were found more than 1½ feet above floor level, and all were beneath several feet of culturally sterile sand, those recovered from each pit house will be described in a single grouping. Nomenclature already applied to the surface collection will be used when appropriate.

Pit House 1: 1 painted sherd; 21 plain sherds:

afinis Lino Gray-F	17 sherds, probably from 1 vessel
afinis Lino Gray-D	2 sherds
afinis Alma Neck-banded-C	2 sherds (see description below)
San Marcial B/W	1 sherd

Sherd Type: *afinis Alma Neck-banded-C.*

Construction: coiled and scraped; upper 2 coil lines not obliterated, but well smoothed to produce effect of convex horizontal bands; coils ca. 15.0 mm. wide, walls 4.5 to 5.5 mm. thick.

Surface Color: orange-brown.

Core: gray, but exterior half burned to brick red.

Paste: gray; breaks with medium fracture.

Temper: coarse waterworn quartz sand; few basaltic grains.

Finish: smoothed and either scraped or brushed; faint lines from this process show on both surfaces; temper shows on both surfaces; rims slightly pinched.

Remarks: smoothing process used on upper 2 coils gives opposite effect to that produced in "afinis Alma Neck-banded-B" type; these sherds quite probably rim sherds from vessel represented by the 17 afinis Lino Gray-F sherds.

Pit House 2: 3 painted sherds; 30 plain sherds:

afinis Lino Gray-F	13 sherds, including about ⅓ of large vessel, of northern (?) shape
afinis Alma Plain-B	5 sherds; also 1 "cloud-blower" pipe
afinis Lino Gray-B	5 sherds; 1 shows traces of fugitive red; 1 has wide vertical handle
afinis Alma Plain-C	3 sherds, 2 quite large
afinis Lino Gray-C	1 sherd
afinis Lino Gray-E	1 sherd
Tamaya Red	1 sherd
afinis Alma Smudged-A	1 sherd
afinis Cerros-Abajo R/Br	2 sherds
San Marcial B/W	1 sherd

Sherd Type: *afinis Alma Plain-B.*

Construction: coiled and polished; walls 4.0 to 5.0 mm. thick.

Surface Color: majority varies from brown to dark gray; 1 sherd has red-orange surface (from firing?).

Core: gray, but outer portions often reddish.

Paste: gray; breaks with medium fracture.

Temper: fairly fine to medium waterworn quartz sand; some basaltic grains.

Finish: smoothed and polished, but not to high luster; surfaces tend to be pitted, temper shows through only slightly.

Remarks: apparently a carefully made version of afinis Lino Gray-G.

Sherd Type: *afinis Alma Plain-C.*

Construction: coiled and polished; walls 3.5 to 6.0 thick.

Surface Color: majority black; varies through gray to tan.

Core: gray, but outer ⅓ burned reddish; darker surface color forms contrasting border to core.

Paste: gray; breaks with medium to sharp fracture.

Temper: crushed rock or sherds, some fine sand.

Finish: smoothed and roughly polished over smudging on both surfaces; polishing marks evident; temper does not show on surfaces.

Remarks: probably from same vessel; ". . . internally and externally show the type of polishing of some of the older Mogollon plain wares" (E. W. Haury, personal communication, Nov. 4, 1953).

Sherd Type: *afinis Alma Smudged-A.*

Construction: coiled and polished; walls ca. 3.0 mm. thick.

Surface Color: exterior light brown; interior black.

Core: brown.

Paste: brown; breaks with crumbly fracture.

Temper: fine waterworn quartz sand.

Finish: smoothed; exterior roughly polished; interior very evenly polished to dull glossy black; temper does not show on either surface.

Remarks: of general San Francisco tradition, but not as highly polished; ". . . early smudged, ex-Mogollon" type (E. W. Haury, personal communication, Nov. 4, 1953).

Pottery Discussion. The pottery from both the surface and pit houses presents as much of a mixture of northern and southern tradition as does the architecture. In a personal communication regarding the material from this site, Haury has stated that "most noteworthy is the blending of northern and southern traditions" (June 2, 1953). Later this same authority wrote that our "chief problem is a taxonomic one in trying to establish modes in a series which grade smoothly from one kind of pottery into another" (November 4, 1953). In view of the lack of sufficient distributional and

quantitative data at the present time, we do not feel it wise to present a series of new "pottery types," but rather will describe the variations using a generalized nomenclature. Hence the descriptions appear under such categories as "afinis Lino Gray-A," etc. These terms are used descriptively, and in no sense indicate a demonstrated connection. A single exception to the above occurs in the presentation of one new pottery type, Tamaya Red. These unique sherds were of sufficient number and homogeneity to merit a type name.

The descriptive material is lengthy, but purposefully so, as we feel that this problem of gradient pottery types or variations showing both northern and southern ceramic techniques is one that will have to be resolved throughout most of the middle Rio Grande area. It is hoped that this information will be useful in later determining just which variations represent usable pottery types, and which are merely deviants or variants of these types.

Before individual type discussions are given, certain generalities can be made concerning the sherds from this site, both surface and subsurface. The collection is definitely affiliated with the northern, Anasazi gray ware, tradition more closely than it is with the southern, Mogollon brown ware, tradition. Varying degrees of reducing and oxidizing atmospheres were used by these people in firing their pottery, and there was a tendency to overfire in most cases. The intense oxidation of but one surface of a vessel is common and was probably done intentionally to produce a decorative color contrast. Tempering material is similar in most sherd types, a medium to very coarse waterworn quartz sand which protrudes through vessel surfaces. Floating is very common; slipping, polishing to a high luster, and smudging, while present, are not characteristic of the site.

Interconnections and directions of gradation found in the various sherd and pottery types are shown in Figure 74. From this diagram and the individual descriptions, certain modes can be seen. The most important of these, from a quantitative respect, is the group consisting of types "afinis Lino Gray-B, C, D, E, F," and Tamaya Red. These sherds give the

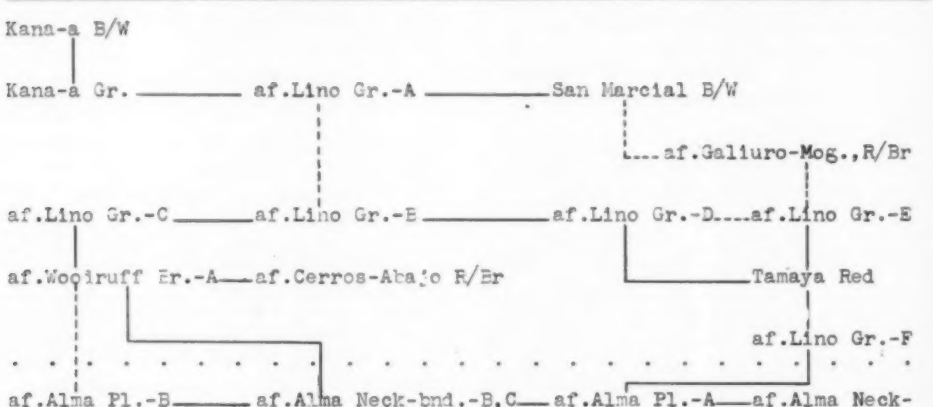

FIG. 74. Relationships among certain pottery types, with northern types above, southern below. Dashed lines indicate weaker connections than do solid lines.

smoothest transition from typically northern examples (afinis Lino Gray-B is but slightly deviant from true Lino Gray) to examples that closely approach the southern Alma series. Sherd types within this group are similar with respect to paste, temper, and surface finish; firing conditions are responsible for the main differences. This group of sherds constitutes 58 percent of the plain wares recovered from the surface, and 49 percent of the total surface collection.

Sherd types resembling Woodruff Brown, San Francisco Red, and Alma Plain were in the minority; their differences from the standard pottery types for which they are named are given in the individual descriptions. It is believed that the Jornada (or El Paso) Brown sherds are of considerable importance; their significance is discussed in the concluding section. It is interesting to note that parallels to sherd type "afinis Woodruff Brown-A" with respect to temper, surface color, and finish only (U.N.M. collection; sherd Ariz:P:16:20 H-6 strat. .25-.7), and to the Jornada Brown sherds with respect to paste, temper, and general surface treatment only (U.N.M. collection; sherd Ariz:P:16:20 A-6), were found in a small collection of sherds from the Bluff site in the Forestdale Valley, Arizona.

Inasmuch as the 4 Red-on-brown sherds from this site do not fall into any of the recognized R/Br types previously defined, a few comparative notes will be added. The 3 sherds described as "afinis Cerros-Abajo" R/Br can be best described on a comparative basis as: 1) similar to Abajo R/O with respect to paste, temper, and firing technique; 2) in general similar to Abajo R/O with respect to surface treatment, but not as highly polished; 3) similar to Cerros R/Br with respect to paint and background color, design type and execution, and surface treatment.

Wherever a similarity is noted between the Santa Ana sherds and Abajo R/O, there is a corresponding difference to be found in the Cerros R/Br sherds. The converse of this is also true. Haury has commented that 2 sherds of the "afinis Cerros-Abajo" type were "suggestive of Mogollon red/brown but atypical" (personal communication, Nov. 4, 1953). Similarities that can be noted are with respect to paste, core color, firing technique, design elements, and to a lesser degree, to temper. The last differs in that black specks due to basaltic inclusions are noticeable on the Santa Ana sherds, but are not typical of Mogollon B/Br sherds. The Santa Ana sherds differ from Mogollon R/Br in that the former are not as well polished, their background color is lighter, the designs are more finely painted, and there is no exterior slip or wash. These differences of the Santa Ana sherds from Mogollon R/Br also differentiate them from San Lorenzo R/Br.

The single sherd described as "afinis Galiuro-Mogollon Red-on-brown" might suggest an intensely overfired sherd of San Marcial Black-on-white, but the high polish of its painted surface is atypical of this latter pottery type. In paint and background color this sherd resembles both Galiuro R/Br and Mogollon R/Br, and it may be an attempt to imitate one of these pottery types. The burned exterior of this sherd presents an interesting parallel to the colored exteriors of Mogollon R/Br and Pinaleno R/Br. This latter type, antecedent to the Galiuro R/Br, is of further interest in that it is also similar to the 3 "afinis Cerros-Abajo" R/Br sherds with respect to paint, background color, and general design elements.

Summary and Conclusions. The primary conclusion to be derived from this excavation is that there was a late Basket Maker III-early Pueblo I type of culture extant in the middle Rio Grande Valley. Pit house architecture, black-on-white pottery accompanied by plain wares of a preponderantly Lino Gray tradition, and the stemless tubular clay pipe all tend to establish this identification.

Comparative examination of the data from the pit houses indicates that their builders were typical of neither the northern Anasazi groups, as found at Ackmen-Lowry, White Mound, Shabikeschee Village, etc., nor of the southern Mogollon groups, as found in the Forestdale and Pine Lawn valleys. Architectural and ceramic characteristics of both areas were found, but it is with the area to the west of Santa Ana that we find our most specific affiliations, i.e., architectural affiliations with the Bear Ruin in the Forestdale Valley, and ceramic affiliations with the Petrified Forest-Little Colorado area.

Since San Marcial B/W is the typical painted pottery type for this site, and as it was found associated with plain wares of an essentially Lino tradition, we would suggest a modification of certain tentative suggestions advanced by

H. P. Mera (1935: 26). Mera, in delineating the range of San Marcial B/W, had only surface sites with which to work. He postulated the existence of architectural remains at some of these locations, but such were never actually found or excavated. Most of his sites were located to the south of Santa Ana, and apparently contained a higher percentage of brown wares, such as are classified herein as "afinis Aima-A," Jornada Brown, etc. On the basis of this he postulated that the makers of the San Marcial B/W may have been essentially a southern people imitating certain ceramic styles of their neighbors to the north. (See also Lehmer 1948: 74.) Whereas this possibility has not been definitely disproven by this excavation, it would seem more likely that the makers of San Marcial B/W were essentially of the Anasazi ceramic tradition. They utilized both a reducing and an oxidizing atmosphere in the manufacture of ceramics, at times randomly and at times purposefully. With such knowledge they would have been able to copy the brown wares of the people to the south, if they so desired. The smooth gradation of surface colors from grays to browns occurring in wares that are in other respects identical gives considerable weight to the possibility that the actual firing of pottery was done under conditions producing a borderline condition between a true oxidizing and a true reducing atmosphere. Such factors as fuel type and quantity, wind, and duration of firing, may have determined the surface color of a vessel, rather than oven vs. open pit firing.

The use of the term "late Basket Maker III-early Pueblo I" may lead some to wonder if we are not begging the question of classification. Actually, generally accepted criteria of both periods are found at the site near Santa Ana. Pit houses, unslipped black-on-white pottery, the use of fugitive red paint, and the presence of polished wares similar to the early Mogollon varieties all admit the possibility of a B.M. III horizon; Kana-a Gray and Kana-a B/W are considered as indicative of a Pueblo I horizon. Inasmuch as Haury has demonstrated a southern priority in the techniques of neckbanding, slipping, and smudging (Haury 1940: 83, Fig. 28), it may be that such techniques were practiced by essentially B.M. III groups of the southern Anasazi area. On the other hand, the continued use of pit houses and unslipped decorated wares could have been practiced in peripheral areas by people of an essentially Pueblo I horizon. The data obtained from the Santa Ana excavations was sufficient to raise again this old problem of Southwestern archaeology, but not sufficient to lead to its solution. It is hoped that future investigation, and possibly dates from this site, using charcoal recovered from the pit houses, will be of assistance in this matter.

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EXCAVATIONS AT THE POLVO SITE IN WESTERN TEXAS

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IN THE SUMMER of 1949 an archaeological field group, sponsored by the University of Texas, excavated a large house structure at the Polvo site (57D2-3) in western Texas. The previous summer J. Charles Kelley had excavated 2 structures at this site, which he reported in 1949. The site itself he identified as a component of the Bravo Valley aspect.

The Polvo site is located in southern Presidio County, Texas, some 8 miles south of the junction of the Rio Grande and the Rio Conchos, in what is referred to as the "La Junta" region of the Big Bend. The site lies about one mile to the southwest of the modern village of Redford, at the edge of the old Mexican pueblito Polvo. Physiographically, the site is located in the Redford Valley, through which the Rio Grande flows into the Cañon Colorado. Midway in the valley, an arroyo, known locally as the Arroyo Bayo Nuevo, enters the river. The site is located directly across from this arroyo, on the northern alluvial bank of the Rio Grande. Tributary streams have cut into the main terrace mass, leaving narrow valleys which are floored with the low terrace gravel. This results in narrow mesa tongues, often isolated from the main terrace, or connected only by narrow saddles. These high, flat-topped mesas adjoining the flood plains were usually the preferred locations of the prehistoric and historic groups living in the area, although in this case it was the alluvial surface itself.

The exact size of the Polvo site is not known, although it is the largest of the Bravo Valley aspect sites found in the immediate area. In general the site rises at the center and slopes downward toward the arroyo. Large refuse heaps and accumulations of fire-cracked stones can be seen scattered over the entire area. Most of the site is covered with scattered clumps of greasewood, mesquite, and cactus. From the eroded surface surrounding the excavated area a sizable surface collection of pottery and stone artifacts was made and identified in the following classes and types:

SURFACE STONE ARTIFACTS

End-notched pebbles	5
Manos one-hand, two-faced	2
Manos one-hand, one-faced	3
Hammerstones	2
Scrapers and/or blades	9
Arrowpoints, Fresno Triangular	5
Arrowpoints, Perdiz Stemmed	4
Arrowpoints, Piedras Triple-notched	17
Arrowpoints, unidentified	6
Total	53

SURFACE POTTERY

El Paso Polychrome	7
El Paso Variant	2
Conchos Plain	141
Conchos Red-on-brown	13
Plain Brown	5
Playas Red (?)	2
Babicora Polychrome	1
Historic Mexican	48
Total	219

To date, only a small portion of the site has been excavated. House No. 1 and House No. 2 (Fig. 75) were identified by Kelley as components of the La Junta focus of the Bravo Valley aspect (Kelley 1949). However, House No. 3 with which this report is primarily concerned is also identified as belonging to the La Junta focus on the basis of the pottery and stone artifacts but differs in type from any found thus far excavated. As a matter of fact, this house appears to be structurally unique in western Texas.

House No. 3 was a large rectangular pit house, lying parallel to Structure No. 2. The northern side of House No. 3 was eroded away; the east and west walls protruded into an arroyo bank. Measured from the south wall the structure was approximately 11 feet long. In depth the pit structure averaged 20 inches, judging from the height of a thin (3 to 5 inches thick) adobe liner plastered against the inside wall. An additional molding, some 6 inches wide and 5 inches high, was plastered around the inside wall base, and probably served as added support for the inside plaster. No opening or doorway was found, although this would not prove the absence of such as the north wall and portions of the west wall were missing. However, the lack of a door would fit into the general house pattern of the Bravo Valley aspect, leaving a roof entrance as a probable explanation.

On the hard-packed natural earth floor lay a mass of intersecting charred beams and saplings, representing burned remains of a roof structure. These ranged from 5-inch beams to small branches less than 1 inch in diameter. On the floor, midway against the south wall was a raised section of adobe 12 inches high and 30 inches square. Embedded in the top of this feature was a highly polished stone slab (15 by 11 by 8 inches). Similar adobe blocks or "altars" (without the stone inset), always found against the south wall, have been described as a La Junta focus trait (Kelley, Campbell, and Lehmer 1940: 34). Adjacent to the altar, on the west side, was a group of fire-cracked stones arranged in a circle some 20 inches in diameter. This ring was covered with loose charcoal and ash and possibly represented a ceremonial hearth. Kelley recorded a similar hearth in a La Junta structure in the lower Rio Conchos valley in Chihuahua, Mexico, although there the pit was against the north side of the altar (Kelley 1951: 114).

From the standpoint of new archaeological information the walls of House No. 3 probably represent the most important trait found at the Polvo site. These were made of turtle-back shaped adobe "bricks" laid longitudinally from ground level and plastered together. This is believed to be the first time such walls have been reported in Texas. Similar construction was found by Lehmer (1948: 44) at the Bradfield site in the Tularosa Basin, across the Organ Mountains from Las Cruces, New Mexico, and again at the Alamogordo site on the alluvial deposits of the Sacramento Mountains, New Mexico. These sites Lehmer classified as belonging to the El Paso phase of the Jornada Branch of the Mogollon. However, Lehmer does not report that the adobe bricks from the El Paso phase were turtle-back shaped. Those from House No. 3 at the Polvo site were characterized by convex top surfaces and concave bottoms, as if the wet adobe had been shaped on the top of an oval stone, or perhaps over the knee. They were quite uniform in size and averaged about 12 by 7 by 4 inches. Another notable difference in the El Paso phase bricks was that they were set in foundation trenches dug 20 to 30 cm. below floor level

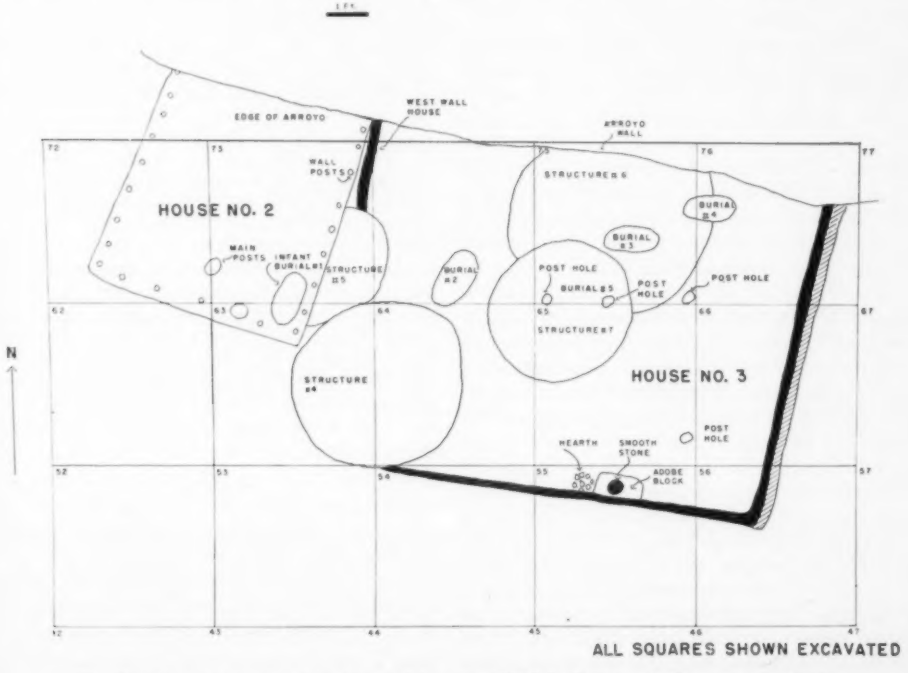

FIG. 75. Plan of houses and burials at Polvo site (57D2-3, Section VI K), western Texas.

(Lehmer 1948: 55). This was not the case at the Polvo site because the pit was lined only with a thin adobe layer. The use of the bricks presumably started at surface level, not in the pit.

At the Millington site (Shafter 7:1), which is the type site for the La Junta focus, there is additional evidence that traits from the El Paso phase were present in the area. One of the 22 structures excavated at this site was built in the El Paso tradition, which Lehmer states is "either a native copy or the product of a colony of El Paso people" (Kelley and Lehmer, n.d.). He points out that this structure bears a strong similarity to the house type characteristic of the southern part of the El Paso phase area, especially in those of the lower Tularosa Basin about 45 miles north of El Paso. Although there was no evidence of adobe lumps used in the house construction, the presence of an El Paso colony is evidence that relations existed between the peoples of the El Paso phase and the La Junta focus. This suggests that the architecture of the Polvo house may be related to the Bradfield and Alamogordo structures. This relationship is also borne out by the artifact assemblages.

Pedro de Castañeda, a private soldier on Coronado's expedition, recorded the house construction methods at Tiguex, a province of some 12 villages on the banks of the Rio Grande, in the vicinity of Bernallilo, New Mexico. Speaking of the adobe, Castañeda records (1907) that ". . . they make round balls of this, which they use instead of stones after they dry, fixing them with the same mixture, which comes to be like a stiff clay."

The Polvo site shows other features similar to the Tiguex pueblos inasmuch as the inside walls of House No. 3 were plastered smooth and painted with bands of yellow, black, red, and white colors. No recognizable forms could be detected because the thin adobe plaster was recovered in small fragments, ranging from 1 to 7 inches across. However, at least one fragment was painted with 3 colors, one of which curved and crossed over the other 2. All these bands measured about ¾ inch in width. It was from one of the ruins of the Tiguex Pueblos that Bliss (1948: 218-22) removed the Kuaua mural paintings from the walls of a subterranean kiva. Although the Kuaua murals used prevailingly life forms rather than geometric forms as in House No. 3, the 4 colors found were the same. A green color which Bliss reported as used sparingly was not found in House No. 3. Also it should be noted that the walls of this kiva were made from "irregular dried adobe balls set in adobe mortar."

From the above discussion and many other examples in the literature concerning the use of adobe balls, lumps, or turtle-back bricks in the late Pueblo periods it appears to have been a widespread culture trait. Therefore, there is little evidence to suspect an independent origin for this type of building at the Polvo site. From the central Puebloan area this trait appears to have spread southward into the El Paso phase of the Jornada Branch of the Mogollon. Since the La Junta focus is thought to represent an actual migration of peoples from the El Paso phase, along with certain local and plains influences, it is not hard to conceive of the transmission of this particular type of house structure into the area. The presence of only one example in the La Junta region is unusual, but a problem to be solved by further field investigation.

A total of 5 burials, 4 infant and one adult, were removed in the excavations. Since only one adult burial was found the skeleton remains are not considered of diagnostic importance in themselves. However, the associated artifacts, the high mortality rate, and the burial customs do give us certain information.

Burial No. 1. In brushing the hard adobe floor of House No. 2 for examination and photographing, a small cracked outline indicated the presence of a small pit structure in the southeast corner. This had been overlooked in Kelley's (1949: 94-100) excavations the previous summer because a homogeneous adobe cap blended with the floor covering. After a year's exposure the joined surfaces separated to reveal the pit of an infant burial, measuring 12 inches wide and 30 inches long, with the long axis north-south. Fourteen inches below this adobe cap an infant skeleton of undetermined sex was revealed. The position of burial was flexed on the right side, head to south.

Burial No. 2. Another infant burial pit, measuring 18 by 24 inches, was uncovered in Square 64, oriented north-south. The crumbled infant skeleton was some 12 inches below the floor level of House No. 3. No artifacts were found in association with the skeleton although 3 sherds of El Paso Polychrome were found in the fill material of the burial pit.

Burial No. 3. Another small infant burial pit had been cut 12 inches into the loose fill of a pit structure

which was below the house floor. Only a few scattered bones remained, probably those of an infant less than 6 months old.

Burial No. 4. Still another infant burial was uncovered in Square 66. The 12 by 18-inch pit had been cut into the east wall of Pit No. 6 to a depth of 11 inches. This was an infant of 6 months or less, and only small fragments of the skeleton survived.

Burial No. 5. The only adult burial was located in the center of House No. 3 in Pit Structure No. 7. The association of this burial with the house structure is subject to question although the pit structure was exposed at floor level. However, there is proof that it was dug prior to the destruction of the house, since the burned roof beams rested directly on the top of the pit. The pit itself was circular, measuring 3 feet 6 inches in diameter. The walls were undercut, leaving an overhanging lip at the top. Twenty-five inches below the top of the pit an adult female burial was exposed, tightly flexed on the right side with the head to the southwest. At the same level, or at the depth of the burial, were 3 sherds of El Paso Polychrome pottery, and lying directly on top of the skeleton were a stone bowl and pestle.

There has been no attempt, other than superficial examination, to establish physical type. Although the one adult skull was earth-warped, it appeared to be a mesocranic, and undeformed. The 4 infant skeletons were fragmentary.

All five burials excavated at the Polvo site follow the established mortuary pattern of the La Junta focus. However, this pattern is widespread in time and space through the Southwest. It is perhaps noteworthy that burial beneath house floors, along with personal property is a distinctive trait of the El Paso phase. In the Alamogordo site Lehmer (1948: 70) excavated 6 flexed burials beneath room floors. Although all the burials thus far uncovered at the Polvo site have been within the confines of a house structure it should be pointed out that only a few yards surrounding the houses were excavated. Quite probably extramural burials will be found, as they have been in other La Junta focus sites in the area.

In the excavated areas surrounding House No. 3 and in the fill of the house pit itself a variety of stone artifacts were found, all of which appear to be typical of the Bravo Valley aspect, although they do not represent a complete picture of the complex.

EXCAVATED STONE ARTIFACTS

Metates, shallow-basin; vesicular lava (1), sandstone (1)	2
Manos, one-hand, single grinding plane	5
Pestle, 12 inches long, 4-inch diameter at rounded grinding end; in situ with adult burial	1
Stone bowls, oval, 9 by 7 by 3 inches; 1 in situ with adult burial	2
Blades, base fragments only, thin, pressure flaked, carefully squared corners	4
Scrapers, circular (3), prismatic (1), spokeshave (1), snubnose (1), scraper-gravers (4), side (16)	26
Hammerstones, circular, flint core, used on entire surface	2
Arrowpoints, Fresno Triangular (16), Piedras Triple-notched (23), Toyah Triple-notched (2), Shafter Split-base (1), unidentified (15)	57
Total	99

Perhaps the most noteworthy feature of the lithic materials from the Polvo site is that no distinctive type of stone artifact represented is new; all have been recognized as traits of the Bravo Valley aspect, with the possible exception of one of the above stone bowls, which was painted inside with bands of red paint. Furthermore, no single lithic artifact can be assigned to one particular focus since the stone work appears to have been continuous throughout the aspect.

There is some evidence, although admittedly circumstantial, that the 2 metates found were set in a bin, as is characteristic of the Pueblo milling complex. Both metates are about the same size, have similar basins, were found within a few inches of each other, and both were found with the bottom surface on the 10-inch level resting upon pieces of charred saplings. Further, the coarseness of one and the relative fine grinding surface of the other would coincide with the milling bin principle.

From the above tabulation of stone artifacts it can be seen that by far the most numerous of the stone artifacts from the Polvo site were small, thin, pressure-retouched arrowpoints. The question of arrowpoint origin and relationships is one of the most baffling problems of the Bravo Valley aspect. Typologically, the Bravo Valley points are more closely related to those of the Livermore focus than to those of the El Paso phase. Arrowpoints of the El Paso phase are predominantly small, elongate-triangular, with either a straight or slightly concave base, although side- and base-notched points occur occasionally (Lehmer 1948: 62). In general the arrowpoints of the Bravo Valley are a modified Livermore type, but this is not the complete picture, as other types occur which

indicate the relationships with northern and eastern Texas. It is thought that the Jumano, who were in close contact with the Patarabueye of the La Junta region are responsible for introducing many of these influences (Kelley, n.d.). It may well be that the early Jumano culture is of Livermore origin. At any rate, from the historical and archaeological evidence the Jumano are known to have been great travelers and in contact with groups covering most of Texas. The Toyah focus of central and trans-Pecos Texas, thought to represent the archaeological culture of the Jumano, use Perdiz Pointed-stem, Clinton Contracting-stem, and Fresno Triangular points, all of which are found in the Bravo Valley. Further, one of these, the Perdiz Pointed-stem, is the dominant point type of the Frankston focus in east Texas and the Rockport focus of the Texas Gulf Coast.

At Bravo Valley aspect sites excavated in the Presidio valley and along Alamito Creek, Perdiz Pointed-stem points occur in greater numbers than any other arrowpoint type. Perdiz Pointed-stem has therefore been listed as one of the diagnostic traits of the Bravo Valley aspect (Kelley, Campbell, and Lehmer 1940: 73). But at the Polvo site this type is barely represented. Perhaps the Perdiz points of the La Junta region are all to be attributed to the Jumano, who are known to have spent so much of their time there. If so, they are probably not characteristic of the Bravo Valley aspect at all, but only of the Toyah focus (Jumano) of the region. Accordingly, the complex of arrowpoint types found at the Polvo site may be more characteristic of the Bravo Valley aspect itself than the assemblages reported from the Presidio sites.

TABLE 10. VERTICAL DISTRIBUTION OF ARROWPOINT TYPES

	Surface	0-6"	6-12"	12-18"	18-24" (Floor)	24-30" (Pit)
Fresno Triangular	5	6	5	3	2	—
Piedras Triple-notched	17	3	4	9	5	2
Toyah Triple-notched	—	—	1	—	—	1
Perdiz Stemmed	4	—	—	—	—	—
Shafter Split-base	—	1	—	—	—	—
Unidentified	6	4	3	3	3	2

The Bravo Valley ceramic complex is highly complicated, due primarily to the peripheral location of the area, and early Spanish influence. Certain pottery types of the La Junta focus have been traced up the Rio Grande into the El Paso area and show affiliations with the Southwest. A definitive classification of the later Concepcion and Conchos foci ceramics has not been reached, and probably will not be until more information is obtained regarding other pottery types, especially the Chihuahua wares. As a step in this direction the past 2 seasons work in Chihuahua and Durango have added new light to the overall picture of pottery affiliations between Mexico and the Southwest.

A total of 328 sherds was obtained at the Polvo site both from the surface and at various depths within that portion of the site excavated. Of this number 84 were found within the confines of House No. 3. The vertical distribution of pottery types, by number of sherds and depth are shown in Table 11.

TABLE 11. DISTRIBUTION OF POTTERY TYPES

Pottery	Surface	0-6"	6-12"	12-18"	16-24" (Floor)	24-30" (Pit)	30-36" (Pit)
El Paso Polychrome	7	2	6	32	24	1	1
El Paso Variant	2	—	7	4	5	1	—
Conchos Plain	141	—	—	—	—	—	—
Conchos Red-on-brown	13	—	—	—	—	—	—
Plain Brown	5	2	2	2	—	2	—
Playas Red	2	1	3	—	—	—	—
Chinati Ware	—	3	—	—	—	—	—
Ramos Black	—	—	—	—	1	1	—
Babicora Polychrome	1	—	—	—	—	—	—
Madera Black-on-red	—	—	—	3	—	—	—
Villa Ahumada Polychrome	—	—	1	4	1	—	—
Historic Mexican	48	—	—	—	—	—	—

It can be seen that El Paso Polychrome persisted through the excavated fill and is the predominating type among the sherds associated with House No. 3, especially from floor levels. This ware appears to be intrusive in the region, as does all the pottery associated with the La Junta focus. It is rather widespread up the Rio Grande, but to date this is the southernmost excavated site showing El Paso Polychrome.

In addition to classical El Paso Polychrome 19 sherds were found which have been listed as El Paso variants. All these sherds were much thinner than the classic Polychrome ware, and appear to be better decorated and better fired. The design and paste is that of El Paso, although the temper is fine sand. This is thought to represent a later trade pottery, or perhaps a local copy of El Paso Polychrome.

The Chihuahua culture center is represented at the Polvo site by 6 sherds of Villa Ahumada

Polychrome, 1 sherd of Babicora Polychrome, 2 sherds of Ramos Black, 1 sherd of Madera Black-on-Red, and 6 sherds of Playas Red. One questionable classification here is that of the Playas Red which is ordinarily coarse black or brown, but in this case is very fine and reddish brown. It is recognized that there is usually variation in all pottery types which could account for this difference.

Another type (?) represented by 12 sherds is listed as Plain Brown Chihuahua ware. This does not fall within the classificatory descriptions, although similar sherds were found at Shafter 7:1 (Kelley and Lehmer, n.d.), the type site of the La Junta focus. The outside is a dark reddish brown, slightly polished, whereas the inside is unpolished, and light tan in color. The smoothed-over coil marks are still visible on the outside, which in thickness range from 4 to 6 mm. The paste is dark brown, porous, coarse, and tempered with coarse sand. In general this resembles a carelessly made plain brown ware mentioned by Sayles (1936: 32-3) as being related to the Chihuahua Red wares.

All the preceding pottery types are of Southwestern origin, and appear to be trade pieces. Furthermore, they are in general traits of the La Junta focus, for which no locally made pottery is known. The lack of pottery indigenous to the La Junta focus represents one of the unsolved problems in the region. Even the evidence for local copies is far outweighed by that of actual direct trade for the pottery.

For the second period of the Bravo Valley aspect, the Concepcion focus (about A.D. 1400-1700), there is a sharp break with the previous period. The intrusive wares from New Mexico and Chihuahua disappear, and in their place is an assemblage of plain wares, red-on-gray, and red-on-brown wares. The common household pottery appears to be Chinati Plain, 3 sherds of which were found in the upper levels above House No. 3. These 3 sherds are all the pottery diagnostic of the Concepcion focus found. Several house structures thought to belong to this focus are visible on the surface in the northern portion of the site, which may yield more evidence of Concepcion occupation. Also there is evidence in the historical accounts which identifies 57D2-3 as the site of a Spanish mission established among the Tapalcolmes Indians near the end of the Concepcion focus (Kelley 1953: 42). Nevertheless, there is surprisingly little diagnostic Concepcion focus pottery, which would indicate at most a limited occupation by this focus.

With the founding of Spanish missions in the La Junta region there is increasing evidence in the archaeological remains and historical accounts of a progressive acculturation of the native populations. Two pottery types of this general time period, known as the Conchos focus (A.D. 1700-1800), were found at the Polvo site. These were Conchos Plain and Conchos Red-on-brown sherds, all of which were from the surface.

The greatest problem of Conchos focus pottery is due to the fact that almost identical pottery continued to be made in the following Alamitos focus and is still made in the area today. However, Conchos Plain and Conchos Red-on-brown wares which occur in the Alamitos focus are in association with modern Mexican crockery, whereas in the Conchos focus they occur with Mexican Maiolica. The 141 sherds which have been classed as Conchos Plain, and the 13 sherds classed as Conchos Red-on-brown occur only with Mexican crockery at the Polvo site. Consequently, there is little evidence of a Conchos focus occupation at all, as these probably represent a later time period than that assigned to this focus. Again, the historical accounts bear this out, since the Tapalcolmes mission was recorded as being abandoned and in a ruinous condition in 1747.

The preceding pages present some new archaeological data from a west Texas site and point out certain relationships between this component and other cultures in Texas and the Southwest.

The Indian groups living in the La Junta region, known collectively as the Patarabueye, appear to have developed a culture in situ from about A.D. 1200 to the end of the 18th century. Many changes have taken place within the area, due in part to Spanish influence, but nevertheless there is a definite continuity of culture. Collectively, this culture is known as the Bravo Valley aspect.

It seems likely that the oldest permanent occupants of the Polvo site belong to the earliest component of the Bravo Valley aspect, the La Junta focus (about A.D. 1200-1400). It can be concluded that House No. 3 belongs to this older component, even though it does not represent the typical structure ordinarily recognized as belonging to this focus. The usual La Junta architecture, unlined pit houses with jacal walls, appears to be a mixture of the

El Paso phase house type and a Plains type of structure. House No. 3, a lined pit house with walls of adobe turtle-backs, suggests a more direct relationship with the El Paso phase, the house type of which was originally derived from the Anasazi culture.

The presence of the "altar" along the south wall is further evidence that the structure belongs to the La Junta focus. It is suspected that the "altar" evolved from the deflector found in the south or east quadrant of kivas of the Modified Basket Maker and the later Pueblo periods. At any rate the altar was probably diffused to the Mogollon, as it occurs in the Mimbres period. Altars similar to those of the La Junta focus occur consistently in both room kivas and subterranean kivas of Pueblo IV sites along the middle Rio Grande. Altars also occur in El Paso phase houses, and Lehmer (1948: 80) has suggested that this is an example of borrowing *from* the La Junta focus. It would seem more likely that the reverse occurred; that the El Paso phase of the Jornada Branch of the Mogollon would be the donor, or better, the carrier, of the "altar" tradition into the La Junta region.

The burials thus far excavated at the Polvo site belong to the La Junta focus, a conclusion based on location directly beneath the floors of La Junta Houses 2 and 3. Intramural flexed burials in a circular pit, along with burial offerings, are closely related to widespread traditions of the Anasazi and Mogollon cultures.

The site yielded an unusual amount of stone work for the limited area excavated. All the lithic materials found have been previously recognized as traits of the Bravo Valley aspect. However, the few Perdiz-stemmed arrowpoints found, in comparison with the large numbers found in the Presidio area, would indicate that this type of projectile point has a closer affinity with the Toyah focus than with the Bravo Valley aspect.

The pottery from the site narrows considerably the range of occupation. Eight of the pottery types belong in the La Junta focus, although there is no evidence to show that pottery was actually manufactured in the area. They appear to have been traded in from Chihuahua and the Southwest, particularly from the Mogollon area. Only 3 sherds of Chinati ware indicate Concepcion focus occupation, although the presence of several large pit houses visible on the surface in the northern portion of the site, plus historical accounts, would indicate that there was some occupation during this period. There is even less evidence for Conchos focus occupation, although Conchos focus pottery wares that carried over into the modern Alamitos focus are well represented. All the historic ceramics belong to an early modern occupation, perhaps that inaugurated with the founding of the village of Polvo on the site in 1872. Occupation still continues at the site today, although most of the inhabitants have left to live in its successor, the modern village of Redford.

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Southern Illinois University
Carbondale, Ill.
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A NEW TYPE OF ANCIENT PERUVIAN SHIRT

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THE SHIRT which is the subject of this article is of importance for several reasons: it exemplifies a revolutionary construction principle in old Peruvian dress, indicates that the new style was one still based on the weaver's art, and gives significance to textile fragments which heretofore have been anomalous.

The specimen (Fig. 76) is the property of Edwin Ferdon of the Museum of New Mexico, Santa Fe, who has kindly given permission for a descriptive and analytical article concerning it. In the spring of 1953 the writer examined the specimen, then on loan to the Department of Anthropology, University of New Mexico. I wish to thank Frank Hibben, Curator of the Department's collections, for making this textile available for study, and Joseph Allen for photographing it. The shirt bears the loan number UNM F 15-93. My colleague, John Rowe, has kindly assisted with advice on the dating given herein.

The garment was found in 1935 partially imbedded in surface earth of a cemetery at Piedras, about 6 km. south of Ancon. At that time the owner was a youthful member of a student group with the late Edgar L. Hewett; the visit to the site was little more than a casual reconnoiter and no field notes were made. Fortunately, great care was taken in removing the partially exposed specimen which is in excellent condition.

That the Ferdon shirt is no aberration but a style which had at least local distribution is verified by data presented below. Furthermore, there is a reasonable certainty that the garment was not merely grave furniture; it had been worn. The outside of the neck area is clean and bright; inside it is discolored with what appears to be body soil. Like most Peruvian shirts this one is identical back and front, but what I believe to be the back is worn out in the lower center portion. The fabric is of soft spun wool yarn; the back (?) area, where rubbing would occur from leaning back, is abraded and fuzzed all around the hole in the cloth. Similarly, on the front (?) at just those places where the arms would touch the ribs and lower chest there are palpable signs of friction fuzzing of the yarns. Paul A. Kirk, Department of Criminology, University of California, tested a small sample from the back area with the hope of finding remaining biochemical evidence that the garment was actually worn. The negative result, expected because of the fugitive nature of such evidence and the limitations of the sample, does not lessen the probability that the shirt was worn. Dr. Kirk's interest and effort are gratefully acknowledged.

The shirt is constructed of 3 long narrow webs. These have been folded vertically at one side; at the opposite side the ends are sewn together (Fig. 77). The top web (1) is the longest, reaching approximately from elbow to elbow when so folded. Its 2 upper edges are sewn together from the "elbows" to the shoulders, leaving an open section to form the horizontal neck aperture. This web thus forms a continuous sleeve and yoke section across the chest and shoulder blades. The 2 lower, shorter webs (2, 3), when seamed along their horizontal edges, one to Web 1, and to each other, constitute the body of the garment. The lower edges of the extending arm portions are not sewn together, which leaves a long slot in each sleeve for the arms to project.

The principle of construction is just the opposite of that which was standard practice in the Andean area from earliest times. The usual method was to make a horizontal fold in a rectangular cloth, the fold forming the shoulder line. The 2 side edges were seamed from the bottom to just under the arms. A vertical slot might be cut and given a sewn finish to form the neck aperture; or the vertical slot might have been formed during the weaving of the fabric. Another method still following the same principle used 2 matching rectangular webs seamed up the back and front to the point where the neck opening was to be left, then folded over at the shoulders. As before, the sides were seamed up to the armholes. Sometimes no sleeves were added. If sleeves were wanted, 2 small rectangles of fabric were folded horizontally, one end of each sewn to the armholes, and the lower edges sewn together. The resulting tubular sleeves had their arm openings at the ends, like our own.

This typical Peruvian shirt, often incorrectly called a poncho, is untailored. Neither is the new style tailored. Both are composed of rec-

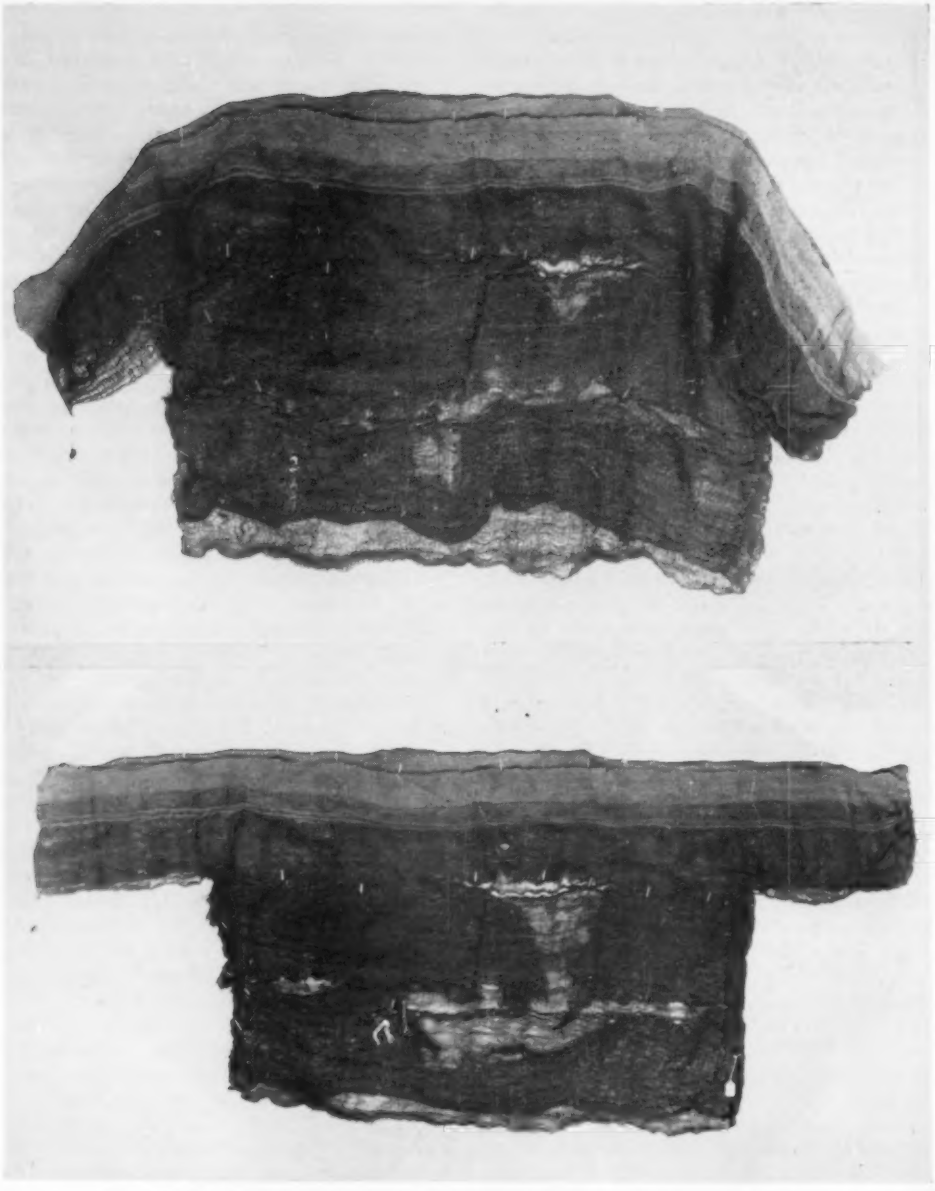

FIG. 76. The Ferdon shirt, from the Rimac Valley, Peru; *upper*, in natural position; *lower*, fully extended; greatest width 55 inches.

tangular webs of cloth which came finished with 4 selvages from the loom. They are merely sewn together without any cutting of the fabric to form pieces or shapes which, when seamed together, would make the resulting garments conform more closely to the body contours.

It has long been obvious to all students of ancient Peruvian culture that the clothing, however luxurious in material or ornamentation, was essentially the product of the weaver's imagination. In either the old standard style or this newly disclosed one, the individual webs which were to be sewn together were planned for size and so made on the loom; ultimate dimensions of a web are predetermined during the warping process. The only attempts at shaped garments, i.e., those which would conform somewhat to the curves of the body bulk, were again weavers' solutions to the problem. Webs which were wide at each end and narrower through the center were used as breechcloths. Other webs, conversely, narrow at each end and gradually wider through the center, were folded at the widest point to form a curving shoulder line for shirts. In most cases the widths of such webs resulted from the weaver's manipulation of the wefts when weaving, tightening the pull on the weft for narrowing or slackening it for widening (Bennett and Bird 1949: 282; Montell 1929: 169, Fig. 82; Osborne 1950: 158). However, garments so shaped were not common in the styles of ancient Peru. And, to the best of my knowledge, the possibilities of shaping garments by gathering, pleating, or stitching folds into a flat cloth were not attempted, either to gain bodily fit or æsthetic diversity in the finished clothing.

Variation in styles of dress were achieved through changes in the weaving styles of the rectangular textiles which composed Peruvian costume: breechcloths, loincloths, shirts, shoulder yokes, belts, sashes, scarves, and mantles. The changes in style were matters of cloth structure, color, and design. The embellishment of fabrics by embroidery, as in the Paracas-Nazca style, still left a single-plane cloth surface; the close, stem-stitch embroidered motifs are analogous to tapestry-woven motifs in their flat textural quality.

In short, the weavers dominated the fashions of Peru from at least the Mochica and Paracas periods, soon after the time of Christ, right through to the Spanish conquest, a span of roughly 1500 years. They produced fabrics from simple to sumptuous, brilliant in color and design conception, lacy gauzes and complex tapestries. But all, when they came from the loom, had only to be sewn along their straight selvages, or for further decoration have fancy border tapes added, which again were weavers' devices. Most of the fabrics needed no seaming as they were used as wrapped or draped garments.

Thus, when a new idea in shirt construction occurred, it is not surprising that it was basically a weaver's product, not a true tailor's, nor even a seamstress's.

The 3 webs which compose the Ferdon shirt are woven to a prescribed size: the top one of greatest length, the lower pair identical for matched seaming to each other, and of comfortable body circumference. The top web (1) has along its upper edge a band of red and gray stripes of glossy, beautifully toned wool yarns. The remainder of that web is dark

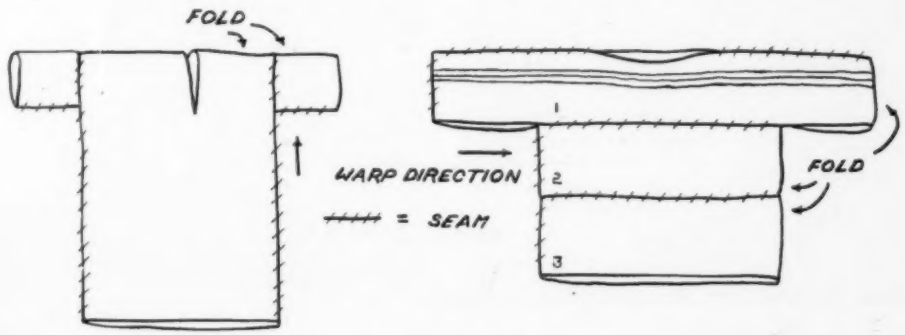

FIG. 77. *Left*, standard Peruvian shirt construction; *right*, construction of Ferdon shirt.

brown wool in an open or spaced weave (Fig. 78, *top*). The same brown yarn and weave are used in the two body webs (2, 3). The total effect is one of handsome simplicity; the warm red and pewter gray bands run from elbow to elbow; the rest of the garment in soft wools of deep brown is somber and dignified.

That the ends of the sleeves are closed and the long underarm edges of the sleeves left open is a most curious feature. Nor does a desire for such sleeves explain the essentially horizontal seaming construction (as opposed to the standard vertical) of this shirt. Had sleeves with underarm slots been desired, all that was

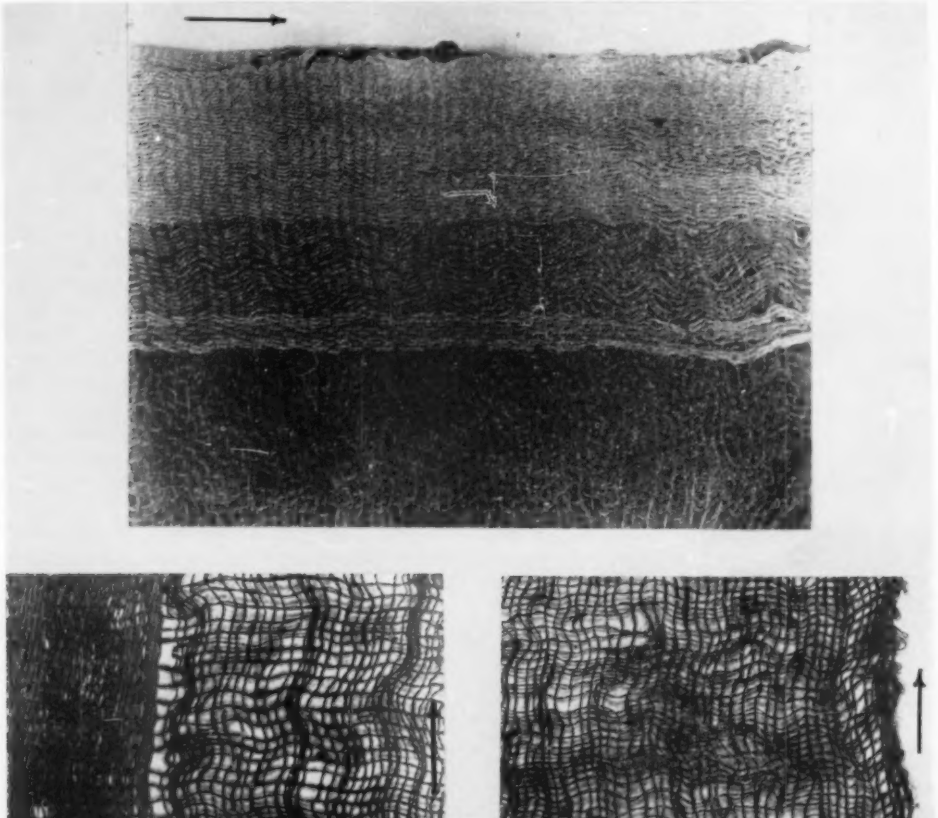

FIG. 78. Details of shirt fabric; *top*, section of border; *lower left*, extra wefts; *lower right*, warp and weft selvages. Arrows indicate warp direction.

necessary was to follow standard practice: to fold a sleeve rectangle as usual, sew up the ends, and leave the under edges open.

One minor item should be noted. At the lower corner of the folded sleeve end there hangs a short double length of the brown yarn which terminates in a little bowlike hank. At first this appears to be part of the sewing or warp-weft yarns; actually it is a separate strand, deliberately placed and tied at this point. It is just visible in Figure 76. Only a symbolic function can be ascribed to it. In the casual handling of Peruvian textiles I occasionally have seen such dangling, tiny hanks of yarn, but assumed them to be ends of loom strings, wefts, or sewing thread. Without search of storage materials I cannot cite a cloth specimen; however, a group of yarn-wrapped "charm sticks" (UCMA 4-4795) from Ica has one of these danglers.

All seams are sewn with a doubled yarn similar to the brown warps and wefts. The coarse whipping stitches are spaced about ½ inch apart.

The unusual construction and fabric of the shirt are instantly recognizable. A reasonably thorough, though not exhaustive, search of pertinent literature has revealed only 3 pictures of such fabric, none of a similar complete shirt. A friend competent to investigate textile matters showed photographs of the shirt to Rebeca Carrión Cachot and Jorge Muelle while in Peru.* Both authorities disclaimed knowledge of such a garment in Peruvian collections, particularly any shirt with a horizontal neck slot. Among others interviewed, only Albert Giesecke, of the American Embassy, recalled seeing material like that in the Ferdon shirt. The striped bands, he said, were always in brown, red, and blue. (Since the gray of the Ferdon shirt is quite mauve in tone, the description is entirely congruent.) He had assumed that such pieces were used anciently as turbans.

No comparable fabrics were on exhibition in the Museo Nacional de Arqueología y Antropología in Lima. However, one length of the striped fabric was displayed at the Museo Larco Herrera, Chiclín, labelled as from Chancay, and another, without provenience, was shown in the Museo de Arqueología de la Universidad de Trujillo. The former was a length of open weave of dark brown yarn, bordered with red. The red area was striped with a yarn faded to a tannish color. The second specimen was like the other save that in the red band the stripes were a dark bluish gray.

The new style of shirt is associated with this particular type of fabric, distinctive and, even in fragments, easily identifiable among hundreds of Peruvian textiles. The University of California Museum of Anthropology possesses 12 specimens of the material from Ancon and Chancay collected by Dr. and Mrs. Max Uhle in 1904. (Ancon: 4-5550A-B, 4-5903, 4-6274A-C; Chancay: 16-1089, 16-1651, 16-1652; Ancon or Chancay: 16-922A-C). Others from Maranga, Rimac Valley, are shown by Jijón y Camaaño (1949 Pls. 83, 7; 84, 6, 7, 8). Reiss and Stübel found several in the Necropolis of Ancon and recognized their peculiarities (1880-87, Vol. 2, text with Pl. 44, 6).

Description of the fabric will be confined here to that of Web 1 of the shirt, combined with some comparisons of the major characteristics of similar University of California specimens, all of which have been fully analyzed. All measurements given are approximate because of the elasticity of the fabric and the condition of some of the specimens. The measurements of the shirt as a garment are: from shoulder to lower edge, 22.7 inches; across body, 32.5 inches; across sleeves, 55 inches; neck slot, 15 inches.

For comparative purposes the webs, particularly the top one, must be considered as textile entities. Like all the other specimens, and most Peruvian cloths, they have 4 selvages. The warps run in the long direction, i.e., horizontally in the garment. The dimensions are: Web 1, 110 by 8 inches; Web 2, 65.5 by 7.5 inches; Web 3, 64 by 7.5 inches. The narrow width, in contrast to the length, is probably due to the nature of the weave. The open spacing of the warps and wefts results in a weak structure, subject to pulling and distortion. Snagging or strain would ruin the alignment of the yarns. This danger is reduced by the short span of the wefts; the problem of placing the wefts is also reduced for the weaver.

The widths of all our bordered webs remain within the close limits of 8 inches (widest) to 6.7 inches (narrowest). The lengths differ markedly, ranging from 110 inches down

*I am deeply indebted to Katherine Drew Jenkins for making these interviews and searches of museum displays on my behalf in May and June, 1953.

through, e.g., 92.7, 85, 70, 55, 45, to 37.5 inches. This was also noted by Reiss and Stübel who state of the fabrics from the Necropolis of Ancon: "The cloths, mostly very long compared to their breadth, occur in all sizes from pieces scarcely half a meter long to others three meters long by 70 centimeters wide. The several strips of which they consist are loosely woven with wide meshes, so that they often look more like net than woven fabric. The black threads, formed of long hair lightly twisted together, are thick and coarse, and the threads lie somewhat closer together only in the red woollen strips, which usually form the hem of the cloth. In several pieces besides this red band there occurs a second woollen strip of a red or violet colour inserted between the wide-meshed portion." The last somewhat ambiguous sentence evidently means that the violet strip was within the red band, as shown by the example in their plate and in conformity with all our known specimens. True dimensions of their Necropolis specimens remain in doubt because the end selvages may not always have been intact. The piece 70 cm. wide probably was a fabric of 3 webs sewn together, like their pictured example which is approximately 64 cm. wide. Their longest dimension, 3 m., differs little from our longest, 110 inches (2.79 m.), taken from Web 1 of the Ferdon shirt.

The two longest bordered webs in the UCMA collection (92.5 inches, 16-1651; 85 inches, 4-6274A) bear strong indications of once having been folded like the top web of the shirt. Each at its center point has a deep permanent groove, symmetrical displacement of warps and wefts, and one has remnants of sewing thread 11 inches from one end.

The fibers of all specimens are wool. The brown yarns are alpaca. The reds and grays probably all are alpaca, but with the possibility of some vicuña fibers intermingled. Vicuña is unlikely since fine pale-colored alpaca would serve for the dyeing and would give the glossy look so pronounced in the Ferdon shirt border.

In ply and in direction and degree of spin, the yarns are remarkably identical. All are 2-ply with an S-twist as the final direction of the paired singles, and the degree of spin varies around "soft." In general, the red and gray yarns range from "soft" toward "medium" in degree of spin, the brown yarns from "soft" toward "very very soft." In the latter yarns the 2 plies sometimes are visibly separated because of the softer spin and the subtle wiriness of the coarser fibers. Yarns differ from specimen to specimen in perfection of spin; some yarns are fairly even, others vary from place to place in tightness of twist, or the yarns are uneven in diameter (slubbed). None are of poor quality; however, the shirt exhibits high standards in this, as in all other, respects.

A uniform color plan is indicated by all specimens having the striped border. Colors matched to the plates of Maerz and Paul (1930) showed only a slight range of tone variation in the blackish browns, a little more in the reds, some of which are faded or blemished, and still more in the grays. The latter, when not blemished, tended to be either a yellowish gray or, more often, a mauve gray. The fine colors retained in the shirt appear to be the ideals: a dark blackish brown (Maerz and Paul 1930: Pl. 8 E 8), glowing rose red (Pl. 5 K 6), and two mauve grays (Pls. 48 C 4 and 48 E 4). In all specimens the brown wools are absolutely unchanged in color quality, whereas the reds and grays are often badly affected by time, turning to such similar tannish tones as to be indistinguishable in certain areas. The brown fibers are natural, the reds and grays dyed.

That the relative widths of the red and gray stripes were standardized is shown by the number of warps allotted for each color. A few examples follow; the numbers begin with the border selvage, here thought of as on the left.

	Brown	Red	Gray	Red	Gray	Red	(Brown spaced
UNM:							
F 15-93	4	86	34	4	4	4	warps in
UCMA:							remainder of
16-1651	2	82	26	4	4	4	fabric)
4-6274A	2	83	24	4	4	4	
16-1089	2	68	10	2	2	2	

The ratio of the border width to the total width is also constant. The border occupies about one third of a web, never a full half or more.

The weave is the same in all the striped webs: a combination of spaced square-count and warp-face, both plain weaves. The long warps are arranged with the border warps set fairly close (for example, 30, 34, 35, 44 to the inch), the remaining brown warps spaced out (for example 4, 5, 7, 9 to the inch). The all-brown wefts are spaced to make a rather regular grid as they cross the brown warps (for example 4, 5, 6, 8 to the inch). When the wefts enter the closely set border warps they are hid-

den; the weave thus, technically speaking, changes from spaced square-count to warp-face (see Fig. 78, *top* and *lower left*). Clearly the aim in the spaced warp-weft areas was to create uniform apertures, but only in the Ferdon shirt has special care been taken to maintain this through the use of extra wefts. A certain mechanical difficulty arises for the weaver because of differentials in the shed openings of the close and the spaced warps. This has been counteracted by occasionally entering an extra throw of weft and returning it before it enters the border warps (Fig. 78, *lower left*). This was not done regularly, but as the weaver felt it was necessary. Usually "fill-in" wefts are regarded as a mark of careless workmanship; here they seem to have been used resourcefully and deliberately.

The selvages in the spaced weave webs of the shirt appear to have 4 warps more closely set, yet the sewing stitches probably have caused their grouping (Fig. 78, *lower right*). Clearly no special treatment was given at the warp ends. The first few wefts are only slightly closer than others, and the yarns are the same throughout. The 2 or 3 thick starting wefts of most Peruvian fabrics are absent in the shirt material and, so far as can be determined, in all the specimens.

The nature of the spaced weave and the narrowness of the webs evoke the question: were these fabrics woven on the standard Peruvian backstrap loom? Conceivably, they could have been done on a frame. If done on a loom it is possible that the heddle and shedroll were attached only in the border warps, and a needle or knobbed bodkin used to "darn" the weft through to the border where the shedding attachments then opened those warps. Such speculation can be answered only by the find of one of these fabrics in the process of construction. Jijón y Camaaño's description of the Maranga specimens as "partially made" (a medio hacer) is due to a misunderstanding of the weaving technique involved (1949: 403).

The homogeneity of the fabrics, whether as fragments or in the shirt, makes it possible to assign a period dating to the materials in hand, since 6 specimens have grave provenience from Ancon. These are: UCMA 4-5550A-B, Site A; 4-5903, Site H, Grave 2; and 4-6274A-C, Site C, Grave 2. All are from Late Ancon II period graves in the Necropolis, the characteristic pottery style in association being Chancay Black-on-white (Strong 1925: 138-9, 158, 185-6.) The Necropolis of Ancon has yielded many of the fabrics according to Reiss and Stübel (1880-87, Vol. 2, text with Pl. 44, 6). While their materials from this site are not differentiated by tomb locale, at least half of the illustrated pottery is of late styles (Strong 1925: 189).

UCMA specimens without grave source are 16-1089, 16-1651, and 16-1652, all from Chancay, the first being specifically from La Mina cemetery which is a late site (Kroeber 1926: 266, 268-9). Three other specimens, 16-922A-C, may be from Ancon (otherwise Chancay); ambiguities in the original catalog of the collector, Mrs. Charlotte Uhle, make identification uncertain. It is probable that the above specimens, all collected by Mrs. Uhle, were surface finds. Dr. Uhle mentions exposed textiles at Site E, Chancay, in cemeteries of the Black-on-white period (Kroeber 1926: 295).

From Maranga in the Rimac Valley come the 4 specimens shown by Jijón y Camaaño (1949: Pls. 83, 7; 84, 6, 7, 8). No grave source is given for the first piece; the others are from Tomb IV (p. 403), which was one of a group of graves later in time than Phase V at Huaca III (pp. 10-11). These graves yielded pottery of Chancay Black-on-white (for example, Tombs III-b, XII-b) or sub-Chancay (for example, Tombs II-b, V-b), late styles in Peruvian chronology.

The Ferdon shirt (UNM F 15-93) was partially imbedded in the earth of a cemetery at Piedras Gordas, possibly a "late" situation.

It is interesting that Chancay wares were present in several instances where the fabrics were found. Another of the fabrics to be credited to Chancay is that in the Museo Larco Herrera, Chiclín. Yet textiles of this peculiar type are absent from the grave materials excavated by Max Uhle at Chancay.

While the total evidence brought together here is slight, it consistently points to a late date for the manufacture of the new style of shirt and its distinctive material.

It cannot be assumed that all fabrics of this type were used for shirts. One specimen (UCMA 4-5903) is composed of 2 entirely brown webs, apparently originally laid flat together and whipped along their upper edges. While they are matched at one end, the longer web extends some 5 inches beyond the other. Both are 9 inches wide; the shorter is 101 inches, the longer 106 inches. The spacings are closer, averaging 10 warps and wefts to the

inch, making a firmer cloth. It could have served as a loincloth, but this is conjectural.

The specimen shown by Reiss and Stübel is composed of 1 striped and 2 plain webs, sewn together to form a flat cloth with a normal right-angle corner: no sleeve could have been formed from the striped web. This cloth, which is torn off across one end, conceivably could have been a mantle or loincloth; its present dimensions are about 47.2 inches long by 25.2 inches wide (3 web widths).

While 2 of our specimens probably were once shirt tops, and some others may have been, the several shorter pieces are too small to be folded double in the fashion of the Ferdon shirt. They could have been used for wrapping around the head turban-wise, as Giesecke suggested.

Any clues as to the status of the former owners are elusive. That the graves from which the textiles came were not those of poor persons is indicated by Reiss and Stübel's statement that: "In the interior of many mummy packs were found such cloths, always carefully folded up, but never under conditions which might have revealed their purpose. The frequency alone of their occurrence seems to imply that they served as articles of dress" (1880-87, Vol. 2, text with Pl. 44, 6).

The materials from Uhle's excavations at Ancon offer a little more similar evidence. Grave 2, Site C, which gave 3 of the fabrics, contained 4 mummies. Objects which accompanied them included a painted cloth mummy mask with an embossed silver forehead band, charm sticks, thread crosses, a mummified monkey and parrot, a Chancay type jar, and several other textiles of no particular distinction.

The double length of plain brown fabric mentioned above was in a family grave (Site H, Grave 2) much disturbed by superimposed burials, according to Uhle's field notes. Therefore, while a large assortment of materials was recovered, a direct linkage between the special fabric and the seemingly important person there interred, cannot be established positively.

The third grave, Site A, produced with the 2 fabric specimens a mummy, textiles of good workmanship, weaving tools, foodstuffs, thread crosses, and Chancay pottery, among other things.

The Chancay ware from all 3 sites was neither abundant nor of finest quality.

In summary, a new Peruvian shirt style using 3 long, vertically folded webs, with horizontal neck slot and sleeves open under the arms, is known from Piedras Gordas near Ancon. The fabric is of so distinctive a type that on the basis of similar textiles from Maranga, Ancon, and Chancay, we can assume the shirt style to have been at least a local fashion. Other garments or accessory pieces of the same material may have been used with it.

The restricted association of the fabrics with Late Ancon II and Chancay Black-on-white wares places them in a just pre-Inca or early Inca context, possibly around A.D. 1400 to 1500.

Until more specimens are made known either by new excavations or from extant collections, we cannot be certain of the full age and distribution of this style of dress in ancient Peru. Whether the shirt was a man's or woman's garment, an official dress, or merely a fad, probably always will remain conjectural.

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University of California
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Berkeley, Calif.
April, 1954

FACTS AND COMMENTS

THE ARTIFICIAL SMALL GROUP STUDY AND ARCHAEOLOGICAL EXCAVATION

When archaeologists go into the field to excavate, they generally pass up excellent opportunities to contribute to ethnology, physical anthropology, linguistics, or some other branch of this ever-widening subject of anthropology. Before undertaking such extracurricular research, the archaeologist must familiarize himself with the general ethnography of his region. Such tools as the *Outline of Cultural Materials* (1950) and *Notes and Queries on Anthropology*, Sixth Edition (1951), can be used to obtain such ethnographic control.

By hiring workmen the archaeologist creates a unique research tool — an *artificial* small group within an already functioning society. This group is artificial in the sense that it does not arise from the society itself, and is likely to cease functioning after the departure of the diggers. The artificial small group consists of locally hired workmen, plus the archaeological party, and seldom numbers over 50. This artificially created group will become a "face to face" or "natural group" (Coon 1948: 563) as it meets from day to day. A new "institution" has been formed, institution being defined as "a group of people who meet together often enough, regularly, and long enough each time, to do something together intensely enough, so that as a separate unity the group builds its own set of rules, its own internal equilibrium, and its own structure." (Coon 1948: 604).

Here, then, is a ready-made subject for study. How does this group function? How is it structured? Does leadership and submission to leadership take a pattern? Is this pattern similar to the role-status situations found in the society? From these and other questions which will naturally arise, it is obvious that the archaeologist must have a research plan before he enters the field. He must know what he is looking for and how to find it. He must be willing to *prepare* himself for his dual role as a technician and human scientist.

I am fully cognizant of the problems of communication, both in the field and in the post mortems. Few archaeologists ever get beyond "cave" or "mound" Arabic, Persian, Urdu, or Pushto in the Middle East. However, in Mexico and Central and South America Spanish is widely spoken. And for that matter, why not make an interactional study of an artificial, small group in the Jura Mountains of France or the Bann River Valley of Ireland? Or among Indians or other Americans in the United States?

Another important factor is the possibility of "call-back" studies. Many archaeologists excavate in the same region season after season, and thus data collected in one season can be discussed with and criticized by the archaeologist's colleagues who specialize in the more theoretical aspects of human behavior. Also, many individuals and groups still resist avowed "social studies," whereas the archaeologist generally achieves intimate rapport with his workmen and can gain much knowledge and insight by means of conversations on the site. Anthropometric or blood-group studies can also arise from such rapport.

No great methodological innovations or theoretical concepts are proposed when I suggest maximum utilization of field archaeological time, money, and energy. Archaeologists should not attempt to become "experts" in all areas of anthropology, as this is obviously impossible. Similarly, no archaeologist is expected to neglect his primary function as an excavator in order to give projective tests. This brief note merely attempts to point the way to maximum utilization of a man's capabilities and interests in the field, and particularly to emphasize that the artificial small group which is created around the business of excavating a site should not be neglected as a resource. I am neither trying to simplify the hazards of such investigations, nor to minimize the probable attacks which may come from those few social anthropologists, sociologists, and archaeologists who insist on supraspecialization, in spite of recent comments by Kroeber, Tax, and others. After all, archaeologists are anthropologists first, and many of them, somewhat like Molière's Monsieur Jourdain, will find that they have been doing artificial small group studies for years without even knowing it.

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January, 1954

EARLY MAN IN THE MAYA AREA

The Maya area has yielded little in the way of Early Man, although certain discoveries, like that at Santa Isabel Iztapan (Aveleyra and Maldonado 1953), have unquestionably established hunters of now extinct fauna in the Valley of Mexico. In Guatemala only a peculiarly cut sloth bone suggests human co-existence with Upper Pleistocene fauna (Shook 1951: 93, 96). But, apart from these, one can only note two other finds, both made some years ago, one at Concepción, Campeche, Mexico, the other in the Petén, Guatemala. These latter discoveries have been treated in a few important studies as containing either sure or probable remnants of a fundamental, early Mesoamerican horizon. I strongly feel that before these particular finds achieve widespread acceptance, in print or otherwise, as exceptionally ancient, they should be re-examined especially from the comparative standpoint.

The Concepción artifacts and those from the Petén were, for the most part, percussion-flaked flint imple-

ments, bifaced, usually with one end rounded, the other relatively pointed, and with unretouched edges, not unlike the Acheulian hand ax of Europe. Ceramic associations appear to have been lacking in both cases and both finds were superficially located. Those from Concepción, described by Engerrand (1912), were found as part of a supposed flint workshop resting on a "limestone that surely belongs to the Pliocene." While it would certainly be beyond the limits of present-day orthodoxy to attribute these objects to such a remote period, there is, nevertheless, a definite tendency to date them to a time level or horizon very much older than known Formative, pre-Classic, or Middle Culture material in Mesoamerica. The same equally applies to Müllerried's Petén finds (1928), with one significant difference, namely, that Müllerried himself noted their similarity to the Concepción pieces, and, in fact, proposed that both groups postdated the 5th century A.D.

The general situation today as regards these two discoveries is as follows: Caso (1953: 229) has placed both groups of artifacts on his "Prehistoric Horizon," one which is dated between 25000? and 5000? B.C. Aveleyra (1950: 42-4) has written that these implements "belong to a very primitive level and a very 'prehistoric' aspect," citing their evident crudity in an archaeological region notable for many cultural superlatives. And in a summary of early industries, Maldonado (1949: 11) has treated this same material on a level approximating that described by Caso; he does, however, consider Müllerried's views on their degree of age.

The striking thing, then, about these objects is primarily that they look old if one depends on the absence of refinements in form and technique. In any scheme of technological evolution they are not what one would usually associate with a high culture people like the Maya. Out of place, they must antedate the known period of Maya development. But to my mind this disregards a fair body of relevant data. For example, closely similar artifacts, whose true function is somewhat problematical, frequently appear in Lowland Maya excavations. At Uaxactun, these so-called "choppers" occurred in all deposits from Early Formative through Late Classic and showed no outstanding changes throughout (Kidder 1947: 5). As noted by Kidder, comparable implements have been recorded for such sites as San José, Benque Viejo, and Labna. In British Honduras, at a small site not too distant from Benque Viejo, the writer and his brother unearthed a number of these artifacts, largely from Late Classic deposits. And while perhaps distinguished by a finer edge than is usual, basically similar implements were found to be quite common at Piedras Negras (Coe, n.d.). Thus they are certainly an item to be anticipated in Lowland digging especially in Classic contexts. It is furthermore most interesting that they appear to be absent in the highland region of the Maya area. It is my impression that, along with the Huaxtecan adzes, the three-quarter and fully-grooved axes of western Mexico, and even the T-shaped axes of the Bay Islands and adjacent mainland of Honduras, the Lowland "chopper" is probably one of the important artifactual exceptions in Mesoamerica, a region that seems to have traditionally favored the ground and pecked celt. In fact it may be necessary to refer to the Chalco Complex of the Valley of Mexico (see de Terra, Romero, and Stewart 1949) for material comparable at least in technical crudity to the utilitarian "choppers" so often found as Maya products in the Yucatan Peninsula. This is not to propose that this complex survived to the southeast. It evidently did disappear, though, in central Mexico, for the earliest known ceramic peoples in that area were decidedly celt users. In contrast, the celt in the Lowland Maya area can hardly be said to be common and, with the curious exception of Copan (Longyear 1952: 105-6), is remarkably rare in deposits preceding those of the Late Classic period. The Highland Maya, however, appear to have been quite as addicted to the celt as any group in the Valley of Mexico, though not as heavily as certain Gulf Coast groups who probably transformed this implement into something of considerable ceremonial value (see Drucker 1952, Pl. 55).

If, then, the Petén and Concepción materials closely resemble in form and chipping technique implements recovered elsewhere in this section of the Maya area from pre-Classic and Classic levels, there are at least typological grounds for questioning the status recently granted them by Caso and others. In short, Mulleried's original idea as to their position in time may have been partly verified by subsequent stratigraphy. Yet, on the other hand, when one considers their time depth and apparent conservativeness within known Lowland sequences, quite apart from their supposed anachronistic qualities, it is not inconceivable that ancestral but perhaps identical artifacts will be found on a preceramic level, still largely a supposition in the Maya area. There is always the *chance* then that the Concepción artifacts and those recovered by Müllerried really are "prehistoric." But this by no means allows their unhesitant placement on a horizon composed of more authentic material. By doing so, an unfortunate impression is given that the case for these finds is closed, when actually the *fact* of exceptional antiquity still needs to be demonstrated.

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NATURAL BURIAL OF ARTIFACTS

In a recent issue of AMERICAN ANTIQUITY Douglas S. Byers, in "Bull Brook — a Fluted Point Site in Ipswich, Massachusetts" (Vol. 19, No. 4, pp. 343-51), pointedly raises the question of how the stone artifacts at this site have become buried rather deeply in the soil. To quote Mr. Byers: "Not the least of the problems is that having to do with the means by which the implements became buried. The surface of the land shows differences in elevation that could not have amounted to more than 5 feet over the entire area. There is no sign of an old land surface at the depth at which the fluted point complex occurs. Neither slope wash, wind action, nor frost action seem to offer satisfactory media for burying the objects. The matter remains a puzzle until further study may uncover new evidence."

This particular dilemma, is one that I am sure will be encountered in the study of any old site, such as the fluted point sites. The occupation of these sites occurred thousands of years ago. They came into being perhaps only a short time after the close of the glacial period, especially in the eastern states. However, the occupation occurred on the present land surface. This surface has been changed only by the simple process of soil weathering. But how did the pieces of chert get into a lower horizon?

I will try to give an answer to this from observations on my farm here at Madison. During the last 13 years I have been growing seed grain on the same land year after year, keeping up the supply of nutrients by the use of fertilizers. Each year I plow the soil and plant the grain. I do this myself, and have a chance to observe every part of the field. There is ample evidence of old Indian occupation of the land, but no fluted points.

It so happens that when I use a bigger tractor and a bigger plow, and thereby plow deeper than ever before, new material comes to the surface from greater depths. Clusters of chips will come up which are obviously composed of the same chert material; these lie in small areas a few feet across on top of the newly-plowed furrows. New arrowheads will show up, and these are usually perfect, not having been broken by earlier contact with farm machinery.

This matter of burial began to intrigue me to such an extent that last fall I carefully dug out a spot where there was a concentration of undisturbed chips on the surface of the newly plowed land. Raw subsoil had come up with the chips. I found that these chips occurred to depths of over a foot beneath the original surface, and the greatest concentration of them was in unplowed soil below the plow layer.

I think that I have a solution to this question of deep burial. This farm is woodland, and was covered for many centuries by forest. Each time a tree occupies a spot of land, the growth of the trunk and the roots opens up a pit in the soil. When the tree dies and rots, the pit remains for a time, and then closes over. The soil falls in around the edges, and small surface stones, and incidentally, the chert artifacts and chips fall into the hole also. Continue this action of "tree plowing" over several thousands of years and all of the soil in a given area will have been inverted at least once, or perhaps several times. This, I think, explains why the fluted point site at Ipswich is now under the surface. The trees of the thousands of years of forest on that site have inverted the soil to the depth of the bases of the stumps.

To further satisfy myself on this matter of burial, last fall I trenched a part of the farm where there is a glacial till soil composed of silt, sand, small stones, and larger boulders. This had never been plowed. I ran a trench 6 feet wide and 3 feet deep through this, taking the soil off the face of the cut with a trowel. In this cut I found that the smaller stones had gravitated to a depth of from 12 to 20 inches, forming a well-defined layer, not precisely level, but rather erratic up and down. Ancient tree root channels were still visible at the depth of the small stone layer, and below. Particles of bark still remained, although the channels were otherwise filled with soil. Chips and artifacts were found from the surface downward to the small

stone layer. Also there were still small stones scattered through the soil above the generalized layer.

Complicating this were the numerous filled ancient animal burrows. The subsoil at a depth of 3 feet was a dense clay. Animals had burrowed down into this clay and had made nest holes, some of which were still open, although the entrance tunnels had long since filled with soil. The yellowish clay had been dragged out to mix with the dark gray upper horizon. The upper soil had seeped down into the clay. It is obvious that artifacts could readily have gravitated down the animal burrows into the clay. In such a woodland soil as I have on my farm, a deep discovery of an artifact is no sure criterion of very ancient age of the artifact.

The burrowing of the animals brings up small stones and artifacts from below, depositing these again on the surface to be again buried by tree plowing. I believe that the trees are by far the more competent force, and that burial of the small surface objects proceeds more rapidly than excavation.

Ants also add their efforts to burial, bringing up small bits of earth to build their mounds, some of which may be 6 or 8 feet in diameter. Their efforts result in further burial of small stones and artifacts. In the aggregate, over the centuries, ants must move a tremendous amount of soil to the surface.

One does not realize to what extent this upper 2 or 3 feet of woodland soil has been worked over by tree plowing and animal burrowing until one has made a careful dig through a soil profile. The activities of these living agencies, the one static, the other mobile, come to light when one has taken the time to trowel through a rather large mass of earth. Earthworms also add their bit to the covering of small stones and artifacts. I found earthworms in dormancy at 3 feet below the surface.

From my own experience as outlined above, the mystery of burial of artifacts is a mystery no longer. This digging venture has given me a new perspective, and I offer the suggestion to others who are working in woodland soil to cut a trench and make their observations first hand. "Getting down to earth" in this matter offers satisfying rewards. I would suggest to those who may be fortunate in finding a stray fluted point or graver on the surface of a field or hill in woodland territory that you mark well the spot and return with shovel and explore deeply. You may discover a new fluted point site long since buried by tree plowing. The significant object you first find may be a "returnee" which was again brought up from below by the plow, or some burrowing gopher, chipmunk, marten, mink, badger, or woodchuck. There may be many of these fluted point sites that await discovery by the diligent use of the shovel and sand screen.

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ADDITIONAL INFORMATION ON THE BULL BROOK SITE, MASSACHUSETTS

Due to the kind invitation of William C. Eldridge and the Vaccaro brothers, discoverers of the site, I have had opportunities to visit and excavate in this fluted-point site during the current spring. In part of the work I was accompanied by Theodore L. Stoddard.

In April we went to examine a possible hearth area where concentrations of charcoal had been reported in association with fragments of artifacts and chips of the stone used by the paleo-Indian occupants of the site. The surface which was exposed lay about 12 inches below ground level and well within the horizon of yellow-brown sand. Concentrations of charcoal were irregular in outline and density, and as one trowelled downwards they appeared to separate into fingers suggesting roots. Associated with some of the better preserved charcoal were bits of carbonized bark. We therefore concluded that the charcoal represented the remains of stumps which had burned out in rather recent woods fires, and that association of charcoal and fragments of paleo-Indian artifacts was purely fortuitous.

Following this visit, we returned at a later date and examined an area in which Eldridge had found a quantity of small fragments of bone. Some of these pieces were no larger than 5 mm. in diameter, but others were of a sufficient size to permit one to recognize them as fragments of a long bone, possibly of a deer. Since no articular surfaces or other recognizable features remain, the possibility of identification of the species of animal seems remote. Nearly all fragments are crackled and give the appearance of having been burned.

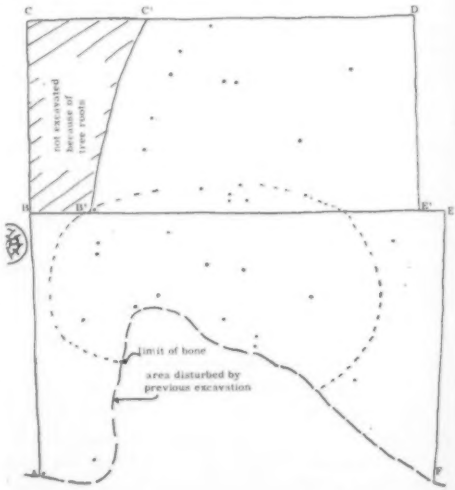

FIG. 79. Plan of test excavation at the Bull Brook site; dots represent locations of specimens. Approximate scale, 4/10 inch equals 1 foot.

We laid out a section measuring roughly 3 by 6 feet to take in the area in which Eldridge found the bone, and proceeded with one more 3 by 6-foot section beyond, so that we eventually excavated the greater part of an area measuring approximately 6 by 6 feet, carefully noting depths and locations of all objects which were found (Fig. 79). An arbitrary datum point was set up on a large tree at one side of the trench, and all depths were measured from it, by means of a line level. Cross sections along the 4 walls which were exposed illustrate the vertical distribution of specimens and the characteristics of soils which we encountered (Fig. 80).

We found fragments of bone in the zone in which chips and paleo-Indian artifacts occurred, but we did not find bone above this zone. Bone and chips and artifacts are so intimately related that it seems impossible to argue that the occurrence of the bone was fortuitous. It therefore seems evident that the place was a campsite at which people not only worked on implements, but where they also ate and threw refuse from their meals in the fire.

Eldridge and his associates were working on a wooded area in which the soil column is composed of the following soil horizons (Fig. 80): (1) loose leaves, twigs, etc., representing the A_{00} horizon; (2) laminated and somewhat fibrous mor representing the A_0 horizon; (3) brown loamy sand representing the A_1 or A_p horizon; (4) yellow-brown sand fading in color as depth increases until it becomes nearly light gray. This latter component represents at least a portion of the B horizon resting on the C horizon. The B and C horizons appear to display the normal profile of soil development which we have seen in sandy soils in this vicinity and show no evidence of disturbance. The B horizon is slightly cemented and after drying is very hard to trowel. The lower, lighter part of this horizon does not appear to be cemented.

In structure the mor was laminated to fibrous, suggesting compacted leaves into the lower portion of which fine roots had begun to penetrate. In some places lenses of clean sand were found either above or in the mor, giving evidence of recent wind action. In one area a very thin (⅛ inch thick) white sandy horizon was observed just below the mor. This appears to be the beginning of a leached horizon, the *bleicherde* of the podzol, forming under mor composed in large part of oak leaves. This amount of leached horizon is known to form in sandy soils of this region in as little as 50 or 75 years. Transition from the brown loamy sand to yellow-brown sand is relatively even over a long distance, and appears to be somewhat abrupt. None of

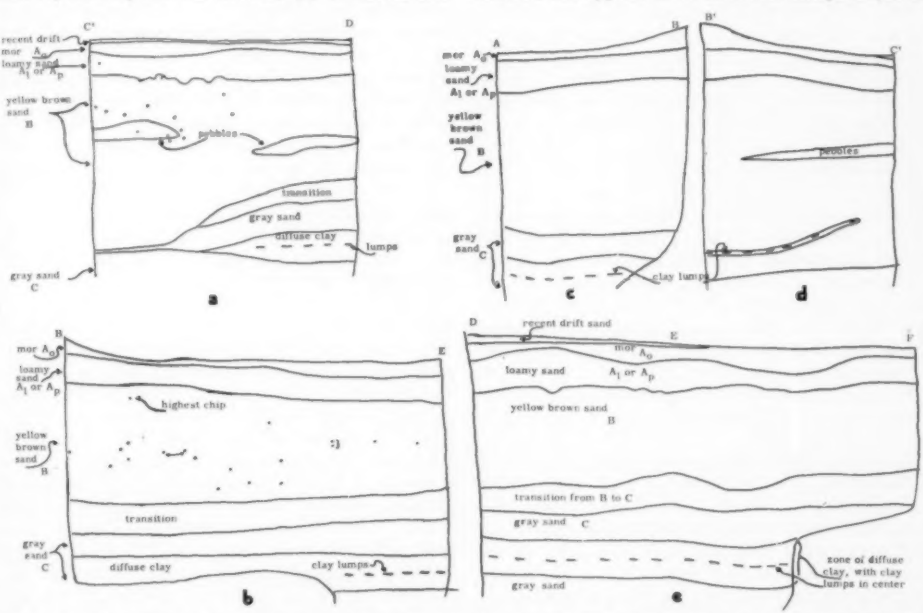

FIG. 80. Walls and soil horizons exposed in test excavations at the Bull Brook site. Dots represent projected locations of the specimens: *a*, C′-D line; the dot in loamy sand represents one fragment of a kaolin pipe; 2 dots at boundary between loamy sand and yellow-brown sand represent fire-cracked stones; *b*, B-E line; double-headed arrow and bracket indicate matching parts of specimens; *c*, A-B line; *d*, B′-C′ line; the B horizon appeared to extend down to the band of clay lumps, gray sand occurring below this horizon, but not above; *e*, D-F line. Approximate scale, 4/10 inch equals 1 foot.

the irregularities common in the boundaries between A and B horizons of undisturbed virgin soils was noted. This suggests that the land had at one time been cleared and cultivated. Confirmatory evidence lies in the finding of material of colonial or later origin within the loamy sand. What seems to be an abandoned road that can be traced through the woods for some distance lies only 100 feet away from the current scene of operations. Trees estimated to be about 50 years old now grow in the road.

In detail the transition from brown loamy sand to yellow-brown sand is found to be a zone some 4 inches thick in which one encounters first a lighter mottling, produced by the introduction of lighter soil from below into the brown loamy sand through insect burrows and other means. In the middle of this zone the mottling becomes rather evenly divided. At the base of the zone one finds darker soil introduced into the yellow-brown through root channels, burrows, and other media. Trees have grown on the land for a length of time sufficient to permit the formation of channels marking the position of former roots, often filled with a rather fibrous mass of rotted wood, rootlets, and whitish sand, sometimes surrounded by pieces of parchment-like bark of the decayed roots. Well within the yellow-brown sand one encounters occasional columnar gray structures which are harder than the surrounding matrix. They appear to be local areas of cementation that are not of recent origin. The over-all picture suggests old farm land which has been abandoned for 50 years or more. A new profile of weathering seems to be developing under the influence of soil-forming processes.

Pebbles were scattered all through the depth of the column in varying quantities. They were only occasionally found in the upper portion. In one trench they showed an appreciable increase in frequency at a depth of 16 to 18 inches; in another trench the greatest frequency was met with in 2 patches, one between 20 and 24 inches, the other between 23 and 27 (Fig. 80, *a*). We have been informed that the depth at which the greatest frequency of pebbles is found is not constant across the kame plain. In some areas the pebbles are closer to the surface, and in others they appear to be most common at greater depths. Wind-cut or fluted surfaces are found on some of these pebbles, but many show no sign of fluting.

In the area excavated by us we found a number of end scrapers, a few side scrapers, flakes with worked edges, gravers, a fragment of retouched blade, and many chips removed by pressure flaking. We also recovered small pieces of bone. They occurred in the yellow-brown sand without apparent reason or association, and with no particularly uniform plane of orientation. The depth at which they occurred is shown in the accompanying figure. Matching fragments of artifacts were found separated by as much as 10 or 15 inches horizontally and 2 inches vertically. Increases in the frequency of pebbles were noted at varying depths, sometimes within the artifact-bearing zone, and sometimes below it. We were told that this relationship is not constant and that in some places pebbles and artifacts are clearly associated, while in others they are not. It may be significant to note that a trench roughly 30 feet long by 3 feet wide dug through an area in which there was a very high frequency of pebbles rather close to the surface did not produce so much as one chip.

It may be argued that because we ourselves found no fluted points we were excavating under circumstances which make our observations not strictly applicable to the fluted points, and that there is no proof that what we found can be referred to the fluted point horizon. Not only are the artifacts which we found typical Bull Brook artifacts in form and technique, but also in material. Furthermore, a fragment of a fluted point was found by Antonio Vaccaro only 10 feet from the edge of the trench at 18 inches depth, and a complete fluted point was found by Joseph Vaccaro about 20 feet away at a depth of 24 inches, both of which are well within the zone in which our implements were found.

The impression gained is that the entire artifact-bearing zone has been unstable and subjected to disturbance over a long-continued period of time. This disturbance could arise from a number of causes, including frost action during a period of intense cold; successive windthrow of trees over a long period of time; or the shifting of sand under the force of winds of varying directions coupled with the trampling and stirring of the sand by the feet of the people who made the implements. These factors either singly or together have undoubtedly contributed to the lack of any recognizable land surface to which the implements might be related, and of any association among the implements. Lack of land surface and of association among artifacts in turn, makes it extremely difficult to place the paleo-Indian occupation with respect to any episode in the history of the site.

Because the manuscript of my article on the Bull Brook site in AMERICAN ANTIQUITY, Vol. 19, No. 4, was prepared at a time when we had not had opportunity to excavate any artifacts personally, and because there might be some doubt in the minds of the readers of that article as to the circumstances under which the artifacts occur, it has seemed wise to prepare this note to supplement what has previously been published.

I am indebted to Walter H. Lyford of the United States Department of Agriculture, Soil Conservation Service, for valued corrections and comments on these observations. For an explanation of terms used in soil analyses, reference should be made to the *Soil Survey Manual*, by Soil Survey Staff, Bureau of Plant Industry, Soils, and Agricultural Engineering, U.S. Dept. of Agriculture Handbook, No. 18, Agricultural Research Administration, U.S. Department of Agriculture; Washington, Government Printing Office, 1951.

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CHEROKEE POTTERY FROM NORTHERN GEORGIA*

From November 15, 1950, to April 7, 1951, an archaeological survey was conducted by the Smithsonian River Basin Surveys, in cooperation with the National Park Service and the Corps of Army Engineers, of the area to be flooded by the dam at Buford, Georgia. On the upper Chattahoochee River we came across an aboriginal cooking pit containing quantities of pottery which could be unhesitatingly identified as historic Cherokee. While a certain amount of confusion as to just what might constitute Cherokee ceramics was dispelled some years ago by the publication of *Hiwassee Island*, it does seem advisable to present the Buford material as an areal and temporal variant. It differs in some particulars from the Overhill pottery described by Lewis and Kneberg from the Little Tennessee; there are other differences from recently identified Cherokee pottery from the middle Etowah River in northwest Georgia; and again, it is unlike some ceramic assemblages from Lower Cherokee towns in northeast Georgia and western South Carolina.

Cherokee archaeology has recently seen a rapid development, particularly in Georgia. There has been some investigation of Cherokee sites incident to river basin salvage archaeology. The University of Georgia has already devoted a field season to the Lower Town of Tugalo on the upper Savannah River, the Georgia Historical Commission work at the Etowah Mounds near Cartersville disclosed a Cherokee occupation there (W. H. Sears, personal communication), and the Commission plans to begin work at the late Cherokee capitol of New Echota this spring. The recently formed Tsali Institute, under the auspices of the Cherokee Historical Association and 4 state universities, participated in the work at Tugalo, and promises to be a major factor in repairing the gaps in our present knowledge.

The Cherokee appear to have been late comers into Georgia and the greater part of eastern Tennessee, displacing Muskogeans from both areas. We first hear of them in 1540 inhabiting Guasili, probably in the mountains of western North Carolina, which may well have been the Peachtree site investigated by Setzler and Jennings (1941). Woodward mentioned "Chorakee" living at the headwaters of the Savannah River in 1674 (Swanton 1946: 110-1), and the Lower Towns were evidently well established before 1715 (Cheves 1894). North central and northwestern Georgia may not have been settled before 1755, if we accept the tradition of the battle of Taliwah recorded by Mooney (1900: 385).

The Cherokee habitation area in Buford Reservoir was situated on a low ridge on the edge of red clay uplands overlooking the right bank of the Chattahoochee River in Forsyth County. This is almost directly across the river from Mud Creek and is on the property of J. F. Boyd, one mile below Brown's Bridge on Georgia Highway 141. The occupation area was approximately 350 feet long by 150 feet wide, and paralleled the river 500 feet away from it. About 400 feet southwest of the Cherokee settlement is the prehistoric Summerour Mound, of much earlier date, and 900 feet northeast is the historic Vann House. The cultural position of the Summerour Mound (9 Fo 44) has not been satisfactorily ascertained, but additional work is planned there before the final flooding of the Reservoir. The Vann House was built sometime between 1805-13.

The Cherokee area had been planted in corn the season before we arrived, and Mr. Boyd remarked that when he and his father used to plough here, years ago, the mule had occasionally stumbled into soft places. These were filled without investigation, but Mr. Boyd supposed that they might have been graves. Our first test pit, dug on the crest of the ridge, showed no aboriginal material: the ploughed zone lay directly on red clay subsoil, and whatever occupation layer might once have existed had been destroyed by cultivation and erosion. Close by, however, we noticed many surface sherds. Upon removing the ploughed soil there was exposed a deposit of sherds and animal bones in a dark-stained ashy area 6 feet across. When this feature was fully excavated we surmised that it had been a cooking pit, preserved on this site by having been dug into the tough clay subsoil.

The plan is shown in Figure 81. The bottom was filled with about one foot of ash deposited in yellow and gray-brown streaks and lenses which suggested that the pit had been used a number of times. A few refired sherds were among the ashes, but in the upper 12 inches of the pit were sherds and animal bones in an almost solid layer, thrown in after the last fire was out and while the pit was still open. None of the bones seems to be of domesticated types, though they have not been examined by a specialist, and deer appears to be the most numerous. There were also a few other specimens of camp refuse: a few freshwater mussel shells, some broken quartzite pebbles, a sherd disc, and a broken projectile point of flint. In this layer were also a number of fragments of fired clay, some with

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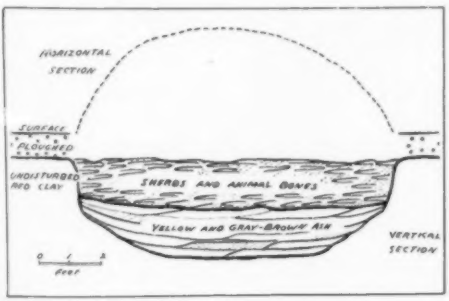

FIG. 81. Cooking pit in a Cherokee site in Georgia.

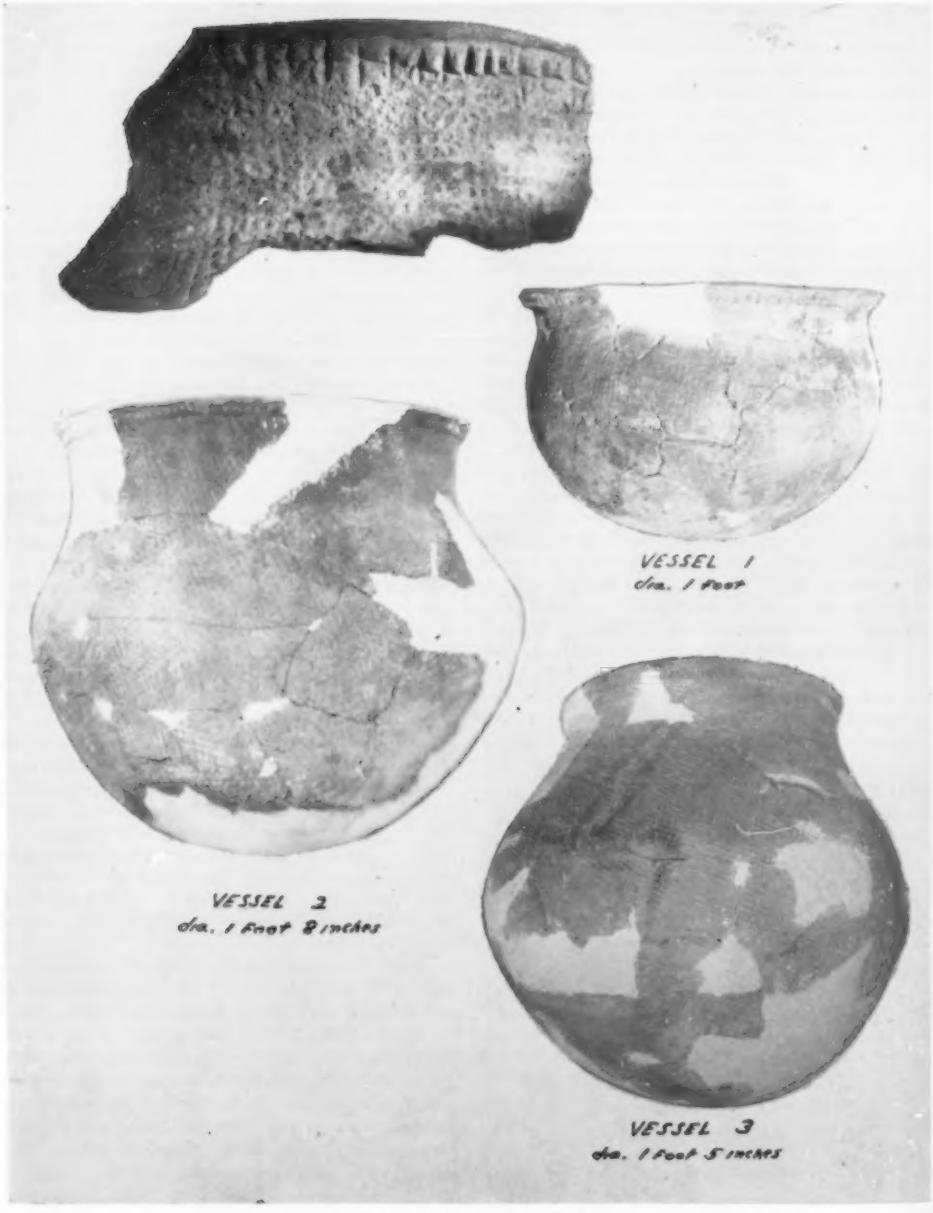

FIG. 82. Boyd Check Stamped jars.

impressions of wood or bark, but without the wattle marks characteristic of prehistoric daub specimens. We think it possible that the old wattle and daub houses were no longer in use at the time the pit was filled, and that the daub was most likely cabin chinking. There were also several European-derived objects in the melange: a charred peach stone, some verdigris-coated copper scraps, and a flattened, rusty iron tube. The latter resembles a section of gun barrel but can not be identified with certainty. There is no question of the contemporaneity of the European objects — the iron fragment, for instance, lay below several animal bones, including the fragile scapula of a deer.

Portions of at least 6 pottery vessels were found in the refuse comprising the top layer in the pit. Three of these have been completely restored, and it will be possible to reconstruct a fourth vessel. There are also some stray rim pieces and a good number of sherds which cannot be fitted to any of the others.

Boyd Check Stamped (Fig. 82)

Sample: restored vessels Nos. 1, 2, 3, partial vessels Nos. 4, 5, and numerous fragments.

Paste: method of manufacture, coiled; temper, medium size grit, not especially abundant; texture, fine to medium; color, reddish buff through dark gray to black; considerable variation in exterior coloring as well as dark gray firing clouds; interior color more uniform, often dark gray or black.

Surface Finish: overall paddle-stamped decoration on vessel exteriors; interiors smoothed or burnished.

Decoration: stamped grid pattern applied with carved paddle, some sherds showing wood grain impressions; individual grid spaces squares, rectangles, or parallelograms; grid lands broader and heavier (up to 2 mm.) than most of the earlier southeastern check stamps. In the repeated application of the paddle to the vessel surface considerable care was exercised to make the lands parallel over the entire vessel. After the stamping had been completed an appliqué rim strip, notched at close intervals, was added to the vessels.

Form: more or less globular with slightly flattened bottoms; throats constricted, rims somewhat flaring. Vessel 3, however, shows only slight eversion of the rim and a narrow opening; vessel 4 has short, narrow, and nearly straight throat.

Complicated Stamped (Fig. 83)

Sample: restorable vessel No. 6; appears similar to Boyd Check Stamped in all respects except decoration; *form* resembles that of vessel No. 1; body *decoration* consists of overall stamped rectilinear design, reconstructed in Fig. 83, *a*. The reed punctation of the rim strip does not occur on any of the check-stamped vessels.

FIG. 83. Complicated Stamped vessel fragment; *a*, restored pattern of stamp.

Boyd Check Stamped is closely related to the eastern Tennessee type Overhill Check Stamped (Lewis and Kneberg 1946: 105-6 and Pl. 55, *B*). Judging from the illustration the stamping and the notched rim strips are like those occurring on the Boyd material. Overhill Check Stamped is tempered with generous amounts of crushed shell, while Boyd Check Stamped is grit tempered.

Another closely related type is Galt Check Stamped (Caldwell 1950) found at presumed Cherokee sites along the middle Etowah River in northwest Georgia. This resembles the Overhill and Boyd varieties in the appearance of the stamping, and especially in the relative broadness of the lands, but is invariably grit tempered and sherds are often distinguished by a blue-white surface color. A relatively broad rim band notched along the bottom seems to be more characteristic of this type.

A similar appearing check-stamped pottery found at some of the Lower Cherokee sites in the Hartwell Reservoir on the upper Savannah River may turn out to be Boyd Check Stamped, to which it is certainly closely related. The sherds are grit tempered. Stamping and rim decoration are at the present time indistinguishable from the Overhill and Boyd varieties.

The Hartwell survey (Caldwell 1953) offered a strong hint concerning the position of the check stamp in late Cherokee ceramics. The pottery assemblages at the Lower Cherokee sites in the reservoir area include complicated, incised, and plain pottery types in the Lamar tradition. The complicated-stamped sherds resemble both Overhill Complicated Stamped and Lamar Complicated Stamped, but there is a notable increment of straight-line motifs. At some sites the check stamp is associated with these types, at others it is not found at all.

At the site 9St8, where testing operations uncovered a complete house pattern with several hundred sherds on the floor, there was no check-stamp pottery and no European-derived material. Presumably this was prehistoric Cherokee.

At 38Oc1, the presumed town of Chauga, a stratigraphic test in the artificial mound showed the usual Lamaroid pottery assemblage at all levels. The major portion of the mound, however, had been built after English trade objects had become numerous, apparently in the late 17th or early 18th century. At no time during the history of this site was check-stamped pottery abundant, but our sample shows that check-stamped sherds reached their greatest frequency, 12 percent of all sherds, in the period after European trade objects became most numerous. There is also a slight suggestion, based upon an insufficient sample, that incised pottery decreased at the same time that the check-stamped became more important.

A small surface collection from the late town of Keowee on Keowee River showed an even greater proportion of check-stamped.

It can therefore be suggested as a preliminary hypothesis that the pottery complex of the Lower Cherokees, at least, was a Lamar variant in protohistoric times, and that early in the 18th century a check-stamped type similar to Boyd Check Stamped was becoming increasingly important. There is a likelihood that the incised pottery, similar to Lamar Bold Incised, was declining while the check-stamped increased. If this is correct, the preponderance of check-stamped pottery at the Boyd site in the Buford Reservoir and its strength at the Galt period sites on the Etowah River may be a function of their late temporal position. The Cherokee settlement of northern Georgia was, except in the extreme northeastern section, a relatively late affair. Mooney's tradition of Taliwah, already cited, would put most settlements after 1755, and others may have come about as a result of the destruction of the Lower Towns during the Revolution.

In historic times several widely separated areas of the Southeast show a strong recurrence of the check-stamped design which was absent in the periods immediately preceding. Besides the variants found among the Cherokee, this design is present in eastern Siouan pottery of the Hillsboro focus (Coe 1952: 311), and among Muskogeans or related peoples in southern Georgia and Florida: Mercier Check Stamped (Sears 1951: 32), Leon Check Stamped (Smith 1948: 318), and Altamaha Check Stamped (Caldwell, Sheila, n.d.). These manifestations occupy roughly comparable positions in time, but probably among none of the others did check stamping become as preponderant as among the Cherokee.

It is of interest to compare the late ceramic sequence assigned to Muskogeans in central Georgia (Fairbanks 1952: 294-9) to our hypothetical sequence for the ceramics of the Lower Cherokees and north Georgia settlements. Among the central Georgia Muskogeans and the Lower Cherokees the protohistoric pottery complexes are variants of Lamar, comprising complicated-stamped, incised, and plain types. By 1715 the Muskogeans had abandoned complicated stamping, while roughening or brushing the surfaces of many vessels and maintaining a degenerate incised type called Ocmulgee Fields Incised. Lower Cherokee sites of about the same period continued the complicated stamped, but dropped the incised type while they added check stamping. Sites in Georgia which are regarded as even later (post 1755?) such as Boyds and some of the Galt period sites on the Etowah River, show no incising but only the check and the complicated stamp.

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December, 1953

THE RANDALL COMPONENT

In a review of the Scalp Creek report (Hurt 1952) Donald J. Lehmer questions the evidence which would warrant the defining of a Randall component at the Scalp Creek site (39GR1), Gregory County, South Dakota (Lehmer 1954). In addition, Lehmer makes this statement, "However, when a subsequent report by Hurt tentatively derives the St. Helena focus of the Upper Republican aspect from a component established on the basis of 39 potsherds, it becomes a matter of somewhat more concern." The writer wishes to summarize the evidence which led him to define a Randall

component, since it is not fully covered in the review, and also to disclaim any adherence to the hypothesis quoted by Lehmer.

The writer defined 3 components at the Scalp Creek site. The lowermost component was assigned to the Loseke Creek focus of the Plains Woodland tradition. The Randall component occupied a midplace in stratigraphy and contained, in addition to the Loseke Creek ceramic types, 39 sherds classified Ellis Plain and Randall Incised (Hurt 1952, Fig. 16, *1-6*). The last 2 types are closely related to certain ceramic material from the Upper Republican and Over focus sites. Lehmer does not believe that these 39 sherds are sufficient in number to segregate the Randall component from the underlying Loseke Creek Woodland component.

Admittedly 39 sherds is a dangerously small number to use as a basis for any type of cultural classification. Unfortunately, when working on South Dakota Woodland sites, a person is forced to deal with a handful of sherds, and he can either attempt to squeeze the last bit of evidence out of them or forget about them. It should be taken into consideration that at the Scalp Creek site and at the nearby Ellis Creek site (39GR2) a grand total of only 132 rim sherds was found. Therefore, the 39 rim sherds of Ellis Plain and Randall Incised comprised 29 percent of the total, a figure which the writer considers to be more significant than the simple number. Furthermore, Ellis Plain and Randall Incised were found only at the Scalp Creek site. No examples have been found in other manifestations of the Loseke Creek focus such as Ellis Creek, Eagle Creek (25HT1), and sites 25PT9 and 25PT12 (Kivett 1952). Continuity in traits between Ellis Plain and Randall Incised and the Loseke Creek Woodland ceramic types is not impressive. Design elements represent an abrupt change, indicative of outside influence rather than local development at the Scalp Creek site.

In view of these facts any of the following may have occurred: (1) the late Woodland occupation at the Scalp Creek site received the Ellis Plain and Randall Incised from an unknown source, which was in turn related to the Upper Republican aspect and the Over focus sites; (2) Ellis Plain and Randall Incised were invented at the site by the Loseke Creek Woodland peoples; or (3) there was a distinct occupation by an unknown cultural complex which supplanted the Woodland occupation. The third hypothesis is questionable because of the association in stratigraphic context of Ellis Plain, Randall Incised, and Loseke Creek types. Whether the occupation level containing these pottery types at the Scalp Creek site should be assigned to a new component to differentiate it from the lower Woodland levels would appear to be a matter of arbitrary classification.

In regard to the quotation given above by Lehmer, the writer is unable to find in his subsequent reports any statements or charts wherein he *derives* the Upper Republican aspect from the Randall component. Presumably Lehmer is referring to the report on the Thomas Riggs site, 39HU1 (Hurt 1953). In Chart 4 of this publication the Randall component is placed in a schematic position, indicating cultural contact with an unknown cultural complex, theoretically ancestral to the St. Helena focus, Upper Republican aspect. This hypothesis does not, however, include the suggestion that the St. Helena focus was derived from the Randall component.

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ARCHAEOLOGY OF THE YALE RESERVOIR, LEWIS RIVER, WASHINGTON

Pacific Power and Light Company of Portland, Oregon, has now completed construction of the Yale dam, flooding 9 miles of one of the largest river valleys in southwestern Washington. Before the dam was completed an agreement was made between E. Robert de Luccia of the Company and Douglas Osborne of the University of Washington and the Washington State Museum to assure that archaeological resources within the reservoir would be permanently recorded. Correspondence was initiated by Dr. Osborne with Mr. de Luccia, who is Vice-President and Chief Engineer of Pacific Power and Light. The understanding of an archaeologist's aims and needs displayed by Mr. de Luccia and his associates is most heartening. The company employed two archaeologists, Thomas Kehoe and Alan Bryan, and supplied subsistence for a period of two weeks for these men and a third student, Ralph Turman.

According to all ethnographic and historical information, the upper Lewis River Valley was not peopled by the Indians until quite recently, and then not from the coastal area, but from the Plateau over the Klikitat Pass. Around 1800 some bands of Klikitat came beyond the blueberry picking region around Mt. Adams and decended the upper Lewis River west of the Cascade

Divide. Within a few years marauding equestrian Klikitats had established a village at the mouth of the Lewis below Vancouver on the Columbia in Chinook territory and soon overran most of the Willamette Valley. They were reported as far south as the Umpqua and Rogue. In 1855 the groups in Oregon were ordered to return to their old territory which was considered for a time to be the region of the Lewis River. However, most of them were incorporated into the newly formed Yakima reservation in 1858, where they lost their official identity as Klikitats. This fact seems to explain why all local white informants refer only to Yakimas as the ones who continued to travel over the pass well into this century.

Very little ethnographically is known about the Klikitat who lived west of the Cascades. Lewis (1906: 196) states that they still lived in mat lodges even though the country was wooded. McClellan (1853, entry for July 25) describes a Klikitat camp within a few miles of the present Yale reservoir which was composed of one tripod frame "with a torn blanket thrown over."

A total of 6 sites, one in the doubtful category, was recorded. Four were very small campsites probably used by travelers and hunting parties. At one site there was found a large amount of chipping debris, composed almost entirely of chalcedony, jasper with chalcedonic quartz, and jasper. As this material occurs locally the site was apparently used primarily as a chipping station.

The most important site was an isolated semisubterranean pit house, located on the river near a spot which was excellent for fishing. The house was on a level bench which divides the river from a large tributary stream. The pit measured 35 by 30 feet and was 5 feet deep below the level of the lip which extended around most of its perimeter. A 3-foot wide trench was laid out from lip to lip after preliminary clearing of brush and fallen trees. Several small trees growing in the pit itself were avoided by the trench. As the 3 by 5-foot excavation at the bottom of the pit proved to be productive, the trench was widened 3 feet to cover the entire flat bottom of the pit. This 6 by 5 by 2-foot deep cut yielded a total of 40 artifacts including 13 projectile points or fragments thereof, 1 drill, 4 knives, 1 knife or projectile point, 2 choppers, 1 end scraper, 1 rubbing stone, 1 chipping hammer, several scrapers, 1 lamellar core, and 1 small lamellar blade. The adjacent square was also extended 3 feet and yielded 1 knife fragment, 1 projectile point, 6 scrapers, 3 choppers and 1 arrowshaft smoother to make a total of 53 artifacts, in addition to several hundred unworked chips of various sizes. Only 9 of the projectile points are complete enough to be classified. One unnotched point is type NA6, the other NBc (Collier and others 1942: 59). Three of the others could be classed as SCa2, 3 more as SCb1, and 1 as SCb2. Such a small series is practically meaningless. However, the presence of a lamellar blade tradition is interesting because of its infrequent occurrence in the Northwest.

Precise microscopic identifications of the rocks and minerals used to make the artifacts were made by Miss Natalie Burt and Mr. Victor Clausen. All 6 of the choppers and 1 scraper are andesite, while the rubbing stone and arrowshaft smoother are both scoria. The other artifacts show a predominance of chalcedony (25 pieces), plus 1 showing relict cellular structure, 1 chalcedonic quartz, 6 jasper with chalcedony, 2 jasper with chalcedonic quartz, 2 jasper, 2 hornfels, and 1 siliceous argillite. Many of the identifications showed unusual structures which will enable correlations with specific quarries in the area. The predominance of andesite and chalcedony undoubtedly indicates occurrence of these materials in the immediate area. Outcroppings of chalcedony were noted in the survey about ½ mile from this site.

One continuous profile was taken along the central axis of the trench from lip to lip. This shows that the original excavation for the house was made into the sterile gravel to a depth of over 5 feet and that the material was piled on the perimeter to form a lip. A thin covering of brown earth and gravel (Stratum I) was then strewn over the level floor which was about 5 feet in diameter. Later, a small pit about 2 feet wide was dug for the fire pit. Stratum II, light brown loam, could have been partially filled in by later inhabitants or was simply slumped material from the top, as it was restricted to the sides of the pit. Stratum III, dark brown humus, is the main occupational layer as shown by the concentration of artifacts within it. The rotten wood and charcoal composing Stratum IV are apparently mostly the remains of trees fallen on the surface from forest fires.

No artifacts were found on the steep sides of the pit or on the lips. From this we must assume that the habitation area was confined to the bottom of the pit with the entrance through the ceiling. Unfortunately the only possible evidence of house structure which was found had been burnt and was lying horizontally.

As most of the surface of the ridge had been a former stream bed, there are many concentrations of rocks strewn around. However, one pile was noted which was quite large. This pile proved upon excavation to be a burial cairn, as some fragments of human bone were found, including the parieto-occipital region of an adult calvarium. The bone fragments and a scraper and a chopper were found in and below a layer of charcoal and ash which lay about 3 inches above the sterile gravel. The burial area was about 3.5 by 1.5 feet and was excavated into the sterile ground 3 to 4 inches. The scarcity of skeletal material must apparently be explained by a water-saturated acidic soil. Two fragments of charred bone, possibly human, were also found in the charcoal layer, which may indicate post-burial partial cremation, or a ceremonial fire for the burning of personal belongings.

The information uncovered by this survey substantiates ethnographic and historical material which indicates that a Plateau group occupied this area. However, the

fact that no indications were found of any object obtained from white traders in the house pit site seems to push back the conjectural date of initial occupation of the area by Plateau people. It seems unlikely that trade goods were not yet obtained in this area by at least 1805. This would be the latest date possible, therefore, for the abandonment of the pit house.

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AN EARLY POTTERY SITE IN THE CHUKCHI PENINSULA

Discovery of a second small prehistoric site in the interior of the Chukchi Peninsula during the summer of 1952 is of interest despite the paucity of the material recovered. The finds, including the first pottery from the region, are sufficient to shed some light on a little-known area whose past is of great concern to Americanists. Okladnikov's report (1953) forms the basis for this account.

The first interior site, consisting of surface finds on the Yakitikiveem River judged on typological grounds to be of "Neolithic" age in the East Siberian sense of the term, was summarized by Krader (1952). Previously, archaeological knowledge of the extreme northeast tip of Siberia had been limited to coastal sites left by a sedentary sea hunting population — ancestors of the Eskimo. The oldest of these are not thought by Russian investigators to go beyond 500 B.C. The Yakitikiveem finds undoubtedly represent the wandering reindeer hunters of the tundra who must have preceded the historic reindeer-breeding population in the interior of the Chukchi Peninsula. Judged by their archaic appearance, the finds are considered older than any of the coastal sites. Especially diagnostic are the finely-retouched lamellar flakes and bifacially-worked arrowpoints. This site can now be located with more assurance than was possible from the original reports at Krader's disposal, and it is desirable to place the correction on record. On the National Geographic Society's map of the U.S.S.R. (1944 edition), an unnamed river flows into the Amguema from the west some 25 miles above its mouth. This is almost certainly the Yakitikiveem. The site is located at approximately the point where the 180th meridian intersects this river, or about 68° N.

The new site is 200 miles southwest of this, on Lake Chirovoe, which lies almost on the Arctic Circle near the Enmuveem River, the westernmost of the 3 sources of the Belaya. The latter flows into the Anadyr from the north about 165 miles above its mouth. The material lay at depths of 10 to 50 cm. in blackened argillaceous soil under a layer of sod and prairie soil; it consisted of reindeer bones, potsherds, and 4 stone artifacts.

The latter comprised: 1) lower part of a large obsidian arrowpoint of triangular outline with a slightly concave base and one rather pronounced barb (the other having broken off), carefully pressure-flaked on both sides with long, narrow, parallel facets — all this indicating long experience in techniques typical for the Neolithic and Early Bronze Age of this part of Siberia (Fig. 84, 6*a*, 6*b*); 2) miniature chip of obsidian (it should be noted that the nearest obsidian is on the Anadyr, some 65 miles away); 3) an even smaller chip of jasper-like blood-red flint with remains of a retouched cutting edge; 4) large, heavy, oval chip of fine-grained dark gray crystalline rock (probably of volcanic origin), with one markedly sharp working edge showing traces of use. This undoubtedly is a scraper of a type well known in the Asiatic Arctic, used in skin dressing, and employed by all inhabitants of the area down to recent times. In the Lena Valley it is common in archaeological sites from Neolithic to Early Iron Age (Fig. 85).

But it is the pottery which is of greatest interest: 13 fairly small sherds representing probably one vessel or at most, 2. One of these is thin-walled, 2 to 3 mm. thick for the most part, with a maximum of 4 mm. The edge of the rim is slightly thickened and rounded (Fig. 84, *1*, *2*). There is also a pronounced outward flare forming a neck or waist in the upper part of the vessel at the throat. As far as can be ascertained, the bottom was

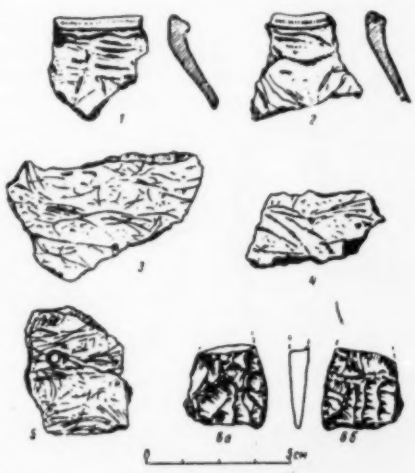

FIG. 84.

round. Both surfaces are smooth, but show all over the imprint of the hair of some fur bearer. The paste is compact and black, with a noticeable admixture of tiny flakes and larger round grains of gravel. Traces of soot indicate use for cooking. Two sherds bear drilled holes (Fig. 84, 5) showing repair and continued use after cracks had developed, as was often the case during the Neolithic and Bronze Age in the Lena Valley.

This pottery differs markedly from the crude, massive, and usually stamped wares of the coastal Eskimo sites. Its main features link it with pottery dated to the end of the Neolithic and the Bronze Age on the lower Lena and especially on the Kolyma, where all the traits of the Lake Chirovoe ware occur, including traces of hair on the outer, and occasionally inner, surfaces. The stone-working technique substantiates this. The arrowpoint is analogous in form and technique to many others in Late Neolithic-Early Bronze sites on the Lena and Kolyma. In the latter region, obsidian was also widely used for arrowpoints from early times. A date of 1500-1000 B.C. is suggested for the Lake Chirovoe finds on this basis.

The absence of pottery at the Yakitikiveem site makes it difficult to judge its relationship to Lake Chirovoe; the stone artifacts are also of different materials. However, it is suggested that Yakitikiveem may be earlier. In any event, the early hunting culture of the interior of the Chukchi Peninsula is definitely linked with that of the lower Lena and Kolyma, and indicates that the area was settled from the west, rather than from the south by peoples of the coastal strip stretching north from the Amur and Sakhalin.

It will be of particular interest to American archaeologists to note that these stone artifacts from the Chukchi Peninsula, as well as those from the Kolyma, remind Okladnikov of comparable material from Alaska as reported by Giddings (1949, 1950) and Rainey (1939, 1940), which typologically, by north Asiatic standards, can be related to the Late Neolithic of the Lena Valley. He feels these Alaskan finds are probably contemporary with the Chukchi Peninsula material, and that together they constitute evidence of pre-Eskimo links between northeast Siberia and America. They are, of course, far removed from any early human movements in the area.

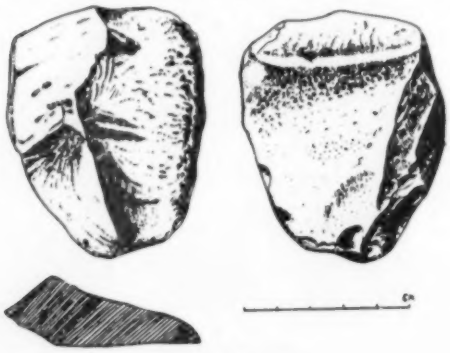

FIG. 85.

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COMMENTS ON INCENSE BURNERS FROM COPAN, HONDURAS

John M. Longyear, in his excellent presentation of the ceramics of Copan (1952), describes a vessel which he tentatively labels an incense burner. The vessel in question belongs to his Archaic period (?–A.D. 300). He considers it to be the only vessel from this period with possible ceremonial connotations. Quoting Longyear (p. 24): "It is a thick-walled, rough-finished vase, set on three solid cylinder legs (fig. 42 *a* [reproduced here as Fig. 86, *a*]). The body is pierced by a number of large, horseshoe-shaped holes. This may very well have been an incensario of some sort." Longyear gives more details about the same vessel (p. 92). "Other thick-walled, coarsely finished sherds appear to come from incensarios of jar type, only two of which could be reconstructed. One is a large jar, of 'hourglass' silhouette, supported on three long solid cylinder legs. The walls are pierced by an undetermined number of horse-shoe-shaped windows, and the basal angle bears indentations made by the fingertip (fig. 42*a*). Rim diameter is 22 cm, over-all height is 30 cm, Archaic period." The other jar-shaped incensario with spiked decoration reconstructed by Longyear belongs to his Classic period and will not be discussed here.

There is little doubt in my mind that the "hourglass-shaped vessel supported on three solid cylinder legs" from Copan is an incense burner. However, I would like to add that it is not an incensario with 3 supports.

The "supports" are in actuality prongs making this specimen a member of the "3-pronged incense burner" complex, a feature common in the pre-Classic and Late Classic archaeological deposits at Kaminaljuyú and elsewhere in Guatemala (Borhegyi 1950; 1951a; 1951c). This is not the first time that this mistake has been made. A similar incense burner "with three legs" from Finca El Progresso (Dept. Santa Rosa in Guatemala) was illustrated by Kidder, Jennings, and Shook (1946 Fig. 202, *c*). I had an opportunity in 1950 to examine this specimen and realized that it belonged to a group of newly recognized ceremonial vessels which I later described as 3-pronged incense burners (Borhegyi 1950a). If the specimen from Copan is turned right-side-up it can be seen that it also belongs to this category (Fig. 86, *b*). Although the Early pre-Classic 3-pronged incense burners from Guatemala are taller on the average (30-40 cm.) than the Copan specimen and frequently have effigy prongs instead of plain prongs, the triangular or horseshoe-shaped windows are a well-recognized characteristic of this type of vessel (Borhegyi 1951a: 111; 1951c Fig. 1, *a*). The plain-pronged type is common during the Miraflores and Arenal phases (1000B.C.-A.D. 1), whereas the effigy-pronged type seems to be dominant during the earlier Las Charcas and Providencia-Sacatepequez phases (2000-1000 B.C.) of the pre-Classic period in the Guatemalan highlands. For some reason 3-pronged incense burners are absent from the Santa Clara phase of the pre-Classic (A.D. 1-200) and from the Early Classic Aurora and Esperanza phases (A.D. 200-500). During the Late Classic period (A.D. 500-900) they reappear in somewhat changed form and both plain and effigy prongs are equally common. During the pre-Classic the distribution of 3-pronged incense burners seems to be confined to the Guatemalan highlands but in the Late Classic they appear as far east as Quiriguá (Borhegyi 1951a Fig. 4, *b* — plain-pronged type) and at San Pedro Sula and Travesia on the northwest coast of Honduras (Stone 1941: 82 and Figs. 93 and 94, *j, o* — effigy-pronged type). It is therefore to be expected that a specimen of this type of incense burner should have been found at Copan although its appearance in the Archaic period is somewhat startling.

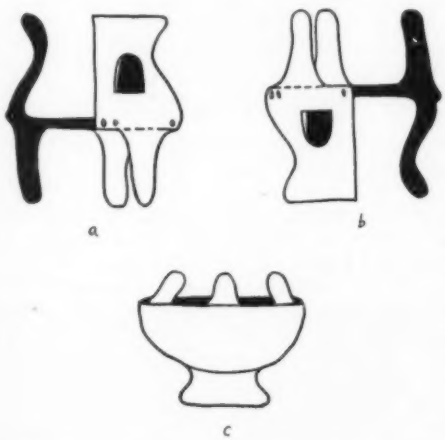

FIG. 86. *a*, Tripod incense burner, Archaic period, Copan, Honduras, as illustrated by Longyear; ht. 30 cm., rim dia. 22 cm. *b*. Same as *a* but turned to appear as 3-pronged incense burner. *c*. Rimhead vessel from Santo Domingo, Oaxaca, Mexico, in Frissell collection, Mitla; ht. 33 cm., rim dia. 38 cm.

The 3-pronged incense burners of Guatemala are usually found associated with deeply-scored covers which give the appearance of being shallow bowls, occasionally with apron overlap and inferior loop handles (Borhegyi 1951a Fig. 5, *c-f*). These were placed atop the 3 prongs. Consequently they are fire-blackened on the interior, the incense having been burned on the top of the incense burner between the prongs. Similar shallow bowls with incised decoration are present in Copan although they were not recognized as 3-pronged incense burners. Longyear describes them (1952: 91) as "incised shallow simple bowls with fairly thin walls." He had no information on the base so it is not known if they had attached loop handles. They bear simple linear incisions (Longyear 1952 Fig. 37, *a*) and some have smoke-blackened exteriors. For this reason Longyear believes that they might have been used in cooking as small comales. Their rim diameters range between 18 and 34 cm. Since the basal diameter of his censer is 22 cm. it is fully possible that some of these "incised shallow bowls" are actually deeply-scored incense burner covers and were supported on top of the 3 prongs of the hourglass-shaped censers. Smoke from the burning incense would have caused their fire-blackened appearance. The only problem seems to be the fact that these incised shallow bowls are from Longyear's Early and Full Classic period, A.D. 450-600 and A.D. 600-800 respectively, and not from the Archaic period. There seem to be 2 alternatives, either these fire-blackened shallow bowls are holdovers from the Archaic or Longyear is incorrect in assigning the hourglass-shaped incensario to this period.

Longyear also mentions "comales with interior handles" (1952: 92 and Fig. 35, *i*). I am inclined to think that these may represent a local form of the Late Classic rimhead vessel at Copan. Longyear describes these fragments (1952: 91) as resembling "loophandled comales in general form. Here, however, handles are hollow cones, rising from interior surface, close to rim. Number of handles per vessel not known, but probably one or two. Period: Last half of Full Classic." Not having seen the actual specimens it is hard for me to say if Longyear is right or wrong in calling them comales. Certainly hollow loop-handled comales are not known in Guatemala nor, to my knowledge, elsewhere in Mesoamerica, but vessels with 3 plain hollow interior loops have been reported from Uaxactun and I have seen 2 restored specimens of this kind in the Frissell

collection in Mitla, Oaxaca, which are believed to have come from Santo Domingo near Etla, Oaxaca (Fig. 86, *c*). They have a single, rather carelessly drawn line of red paint on the interior of the rim. One of the sherds from the "comales with interior handles" in the Copan collection (Longyear 1952: 91) has a similar red line around the interior of the rim. If my theory is correct, the Copan specimens when properly reconstructed would resemble the type of ceremonial vessel known as rimhead vessels. These are closely related both in shape and function to the 3-pronged incense burner complex. The plain or effigy prongs of these vessels may also have supported deeply-scored covers, in which case the incised shallow bowls from Copan were probably used in connection with them rather than as comales or cooking utensils. Unfortunately there is no information on the date or period of the Oaxaca specimens but Late Classic rimhead vessels are common in Mesoamerica and their presence in plain or effigy-prong form at Copan would not be surprising (for their distribution see Borhegyi 1951c: 176; 1951a: 118).

The anthropomorphic effigy incense burner illustrated by Longyear (Fig. 88, *e*) and believed to be of Full Classic date is similar in all respects to a type of incense burner characteristic of the Early Classic Esperanza phase of the Guatemalan highlands. These have been designated loop-nose incense burners because of the looplike protrusion on the upper half of the vessel wall (Borhegyi 1951b; 1951d Fig. 6). The Copan specimen, although from the Full Classic period, undoubtedly belongs to this category of incense burner.

From an analysis of the data presented above it might seem that Longyear's breakdown of the archaeological periods at Copan is open to some question. It may be that the Archaic period at Copan started unusually late but that possibility notwithstanding, the earlier part, at least, of his Full Classic should probably be equated with the later part of the Early Classic Esperanza phase of the Guatemalan highlands.

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1951a A Study of Three-pronged Incense Burners from Guatemala and Adjacent Areas. *CIW, NMAE*, Vol. 4, No. 101, pp. 100-24. Cambridge.

1951b Loop-nose Incense Burners in the Guatemala National Museum. *CIW, NMAE*, Vol. 4, No. 103, pp. 143-58. Cambridge.

1951c Further Notes on Three-pronged Incense Burners and Rim-head Vessels in Guatemala. *CIW, NMAE*, Vol. 4, No. 105, pp. 162-76. Cambridge.

1951d El Incensario de Guayaco. *Revista del Instituto de Antropologia e Historia de Guatemala*, Vol. 3, No. 2, pp. 41-4. Guatemala.

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Longyear, John M. III

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CHINESE FIGURINES IN MESOAMERICA

In a recent article J. Alden Mason (1951) called attention to 2 small Chinese figurines found in local archaeological collections in Mesoamerica. One was from Azqueltan, Jalisco, Mexico and is now in the University Museum, Philadelphia (catalog number NA-11808), and the other was in the Vitalino Robles collection of Quezaltenango, Guatemala. Both are of a soft stone and were described as "crawling infants." While browsing through a collection of archaeological objects in an antique shop in Guatemala City I came across another small Chinese figurine similar in most respects to the ones described by Mason. The shop owner, unaware of the Oriental origin of this specimen, was sure that it must have come in with the other artifacts from Kaminaljuyú, a large archaeological site on the outskirts of the city. The figurine has been presented to the University Museum (catalog number 54-4-1).

Like the Quezaltenango specimen (Mason 1951 Fig. 1, *a*), the stone figurine from Guatemala City is an opaque yellowish-amber color with reddish veins and has a very soft, soapy texture (Mohr scale 2.8). It is made of agalmatolite, "the poor man's jade" in China. It also seems to represent a crawling infant. The head, which now is broken, is large and the limbs short and rudimentary. The wide nose, closed eyes, mouth, and ears are represented by light incisions. These, like the body features, are somewhat worn, probably from much handling. The arms and legs are stubby and the hands and feet are not shown but the female genitalia are distinctly marked (Fig. 87, *a*). The specimen has been perforated with a diameter of 3 mm., obliquely from front to back through the neck. This perforation gives the impression of recency and was undoubtedly made so that the figurine could be worn as a pendant (Fig. 87, *b*). The specimen from Guatemala City is slightly larger than the ones from Azqueltan and Quezaltenango, comparing with them as follows:

	Length	*Height*	*Width*
Guatemala City	4.8 cm.	2.1 cm.	2.8 cm.
Azqueltan	3.7 cm.	2.3 cm.	2.1 cm.
Quezaltenango	3.4 cm.	2.0 cm.	1.6 cm.

It also differs from them in being perforated and in showing female rather than male genitals. (Dr. Mason interpreted the acute incised triangles on the specimen from Azqueltan as representative of male genital organs).

According to Schuyler Camman, Associate Curator of the Oriental Section of the University Museum, similar "crawling infants" are common on the Ting-yao bowls and the Tz'u Chou vases, porcelain pillows, etc. which were made during the Sung dynasty (A.D. 960-1279), or even later during the Ming period (A.D. 1368-1644). He states that today these figurines are "considered merely as toys or as pocket trinkets to be touched or rubbed for the tactile pleasure which the Chinese so greatly appreciate. However, the fact that the male genitalia are often indicated and even emphasized, suggests that they were probably originally, at least, intended as fertility charms to insure the birth of much-desired sons. The context in which they are shown on the Sung porcelains, among many-seeded lotus pods, etc., suggests that in the Medieval period this motif was most certainly considered as a 'symbol of fertility'" (Mason 1951: 273-4).

FIG. 87. Chinese figurines from Guatemala; *a*, from below; *b*, from side. Photograph by Ernest Johanson.

In view of the fact that the specimen illustrated here from Guatemala City definitely shows female genitalia, I would question Mason's identification of the Azqueltan and Quezaltenango specimens as males. I re-examined the figurine in the Robles collection in Quezaltenango and, in my opinion, the triangular incision between the legs of the figurine is more indicative of the female than of the male sex. I would therefore suggest that, although they were probably used as symbols of fertility, they were not necessarily designed to insure the birth of "much-desired sons."

In spite of the curious occurrence of these 3 specimens among archaeological collections in Mesoamerica, I would agree with Mason and Heizer that they were probably brought to the New World during Colonial times or later and are not necessarily indicative of pre-Columbian trans-Pacific contact. These figurines and the "soapstone vessels," like those from Bacalar (Yucatan), Isla de Sacrificios, and the Huaxteca (Heizer 1953; Cammann 1952), may very likely have been brought over on one of the Manila-Acapulco galleons for, as Cammann suggests (Mason 1951: 274), "Many Chinese fled China at the coming of the Manchus in 1664 and went down to Manila and other Philippine towns, later continuing on to the New World to serve as artisans or servants."

Although Chinese immigration to Mesoamerica has never been great, the Chinese colonies in Quezaltenango and Guatemala City have been quite sizable during the last 2 centuries. However, these people are most probably descendants of much more recent immigrants than those who came to Acapulco in Colonial days. If the "crawling infant" figurines and the "soapstone vessels" have been brought to the New World by successive post-Columbian immigrations of Chinese, why then have they been reported only from Mexico, Guatemala, and British Honduras? Certainly other areas in this hemisphere have a Chinese population as great or even greater than these countries. The fact may be that, although similar ones do exist throughout North and South America, they have not been recognized as being Oriental in origin and have been put into collections of local archaeological material. If others are known it would be interesting to have their distribution and more data on them. It would also be worthwhile if more census data were available on Chinese immigration and settlement in Latin American countries so that we, as archaeologists, would know better where to expect to find objects of Chinese origin.

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MASON, J. ALDEN
1951 On Two Chinese Figurines Found in Mesoamerica. In *Homenaje al Doctor Alfonso Caso*, pp. 271-6. Imprenta Nuevo Mundo, Mexico.

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ARCHAEOLOGY AND PROTEINS

Increasingly, Americanist archaeologists are tackling problems relating not only to broad ecological adaptations of the peoples whose cultures they study but also to more specific considerations such as dietary patterns. The amount of light which archaeological data can shed is unknown, but the potential is increasingly probed for enlightening clues. Current ethnographic work in New Guinea prompts the following comments concerning 1) degree of exploitation of available protein sources; and 2) social restrictions influencing protein intake.

Sources of concentrated protein available to the Agarabi are not large. However, they are exploited to such an extent that the diet is not as deficient in protein foods as a superficial view would suggest. Pigs, although highly valued, are not plentiful nor are they eaten in large quantities. Wild fowl and small mammals, again not abundant, are eagerly hunted and consumed. Finally, a wide variety of worms and insects are caught and eaten. Consumption of the latter is hard to check even ethnographically for it is so much a random matter. It is nonetheless common and, for example, a woman finding one cutworm in her garden during a day's work will take it home at night for the evening meal. All in all, with this intensive exploitation of available sources, the protein diet is richer than would be apparent from a count of pig bones found at an Agarabi village site.

Secondly, there is more than chance individual variation in protein intake. Bush rats, one of the more common small mammals, are hunted by individuals of both sexes and of various ages. Rat hunting is a favorite sport of young boys, and although they catch fairly large numbers of them, social regulations prevent them from eating their quarry. We could not assume, therefore, that an approximation of protein intake based on a count of animal bones at a site, divided by the estimated total population, would be valid.

Admittedly, such data as the foregoing are not readily available to the archaeologist. Early travel accounts might give some clues for certain periods, although these aspects of primitive life often did not catch the attention of the casual observer. Biological specialists might aid in determining the protein potential for different periods of the past in given areas. Further, a perusal of ethnographic literature might be rewarding in providing some indications of the relationship between availability of protein foods and the degree to which they are exploited by primitive peoples with varying ecological adaptations.

In any case, although these factors may remain archaeological imponderables, we should not dismiss nor ignore them in our attempts to learn of past dietary practices.

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April, 1954

CORRECTION

In the article by Stig Rydén on drinking tubes on South American vessels (AMERICAN ANTIQUITY, Vol. 20, No. 2, pp. 149-53), a reference should have been included to pottery vessels from Southern Chimborazo comparable to the gold vessel in Rydén's Figure 52. They are illustrated in "Survey and Excavations in Southern Ecuador," by Donald Collier and John V. Murra, *Field Mus. of Nat. Hist., Anth. Ser.*, Vol. 35, 1943, on Plate 2, *2, 5, 7*.

ANNUAL MEETING, 1955

Plans are well advanced for the Twentieth Annual Meeting of the Society for American Archaeology, which will be held at Indiana University, Bloomington, on May 5, 6, and 7. The Society's meeting will be held jointly with those of the American Ethnological Society, the American Folklore Society, the Central States Anthropological Society, and the Society for Applied Anthropology. Glenn A. Black is the representative of the Society for American Archaeology on the Local Arrangements Committee and George I. Quimby is the Program Chairman. The deadline for submitting titles to the Program Chairman will be February 1.

BOOK REVIEWS

EDITED BY WILLIAM A. RITCHIE

Outline of Cultures in the Ohio Region. RICHARD G. MORGAN. In *Archeology of Eastern United States*, edited by James B. Griffin. University of Chicago Press, Chicago, 1952. Pp. 83-98, Figs. 29-36.*

Morgan's paper deals with the prehistoric cultures of Ohio and their relatives in northern Kentucky, eastern Indiana, southeastern Michigan, and northwestern West Virginia. As the title indicates, the paper is made up of a chronologically arranged group of summaries of the various cultural entities recognized for the region.

The paleo-Indian period, discussed under the general heading "Archaic," is represented chiefly by surface finds of fluted points and a few other projectile point forms. No clear association of artifacts and extinct animals has as yet been discovered, although fluted points have been recovered from a nonpottery site in Kentucky. Evidence of a presumably later but still prepottery culture is furnished by surface and rock shelter finds which indicate a culture type much like that exhibited by Indian Knoll and other Kentucky shell heaps.

Two better defined assemblages, the Adena and the Glacial Kame cultures, are assigned to the Early Woodland period, and it is suggested that certain sites having plain and cord-wrapped paddle-stamped pottery are at least approximately contemporaneous. The Glacial Kame culture is known almost exclusively from mortuary sites (burials in gravel knolls), and most of the information on Adena is derived from burial mounds, a highly unsatisfactory situation for adequate characterization and dating. Assignment of any archaeological manifestation to the Early Woodland period is essentially a matter of the absence of clear Hopewell or post-Hopewell affinities and the presence of pottery or other traits not characteristic of the local Archaic. An amply delineated and distinctive culture type which can be shown on stratigraphic or other noncultural evidence to fall into an Archaic-Hopewell chronological gap is not available, although it can be hoped that further work will show that the Adena sites are representatives of such a culture type.

The succeeding Middle Woodland period is defined by the presence of the Hopewell culture, which attained its most spectacular development in the southern Ohio region. As was the case with the Adena and Glacial Kame cultures, knowledge of Hopewell in this region is derived chiefly from burial mounds and other earthworks, not from excavations on village sites, and the description of the culture is necessarily incomplete. A second culture, the "Intrusive Mound" complex, is placed in the Middle Woodland period as a sort of addendum; intrusive burials in Hopewell mounds show that it is later than at least some Hopewell sites, but its cultural affinities lie with the Point Peninsula focus of New York.

The terminal prehistoric cultures of the Ohio region are the well-known Fort Ancient aspect and the Whittlesey focus of the Iroquois aspect; they occupy the Mississippi chronological period and are essentially contemporaneous. Both persisted until the initial period of European contact, and both were visibly influenced by the Middle Mississippi cultural development to the south and west, although this influence was markedly more important in the case of the Fort Ancient culture.

The paper is plainly intended to be a compendium, and viewed in this light it appears to be both authoritative and useful. Explanations in terms of cultural processes are at a minimum, presumably because Morgan reasons that the story in the main is one of development of a single cultural tradition termed, not very informatively, "Woodland." Since the events described include the appearance of new physical types, agriculture with exotic plants, a striking ceremonial complex involving elaborate mortuary practices and tremendous earthworks, the bow and arrow, pottery, and other items, it seems legitimate to suggest that Morgan's treatment of the problems involved is overly brusque.

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Excavations at Kolomoki, Season III and IV, Mound D. WILLIAM H. SEARS. University of Georgia Series in Anthropology, No. 4, Athens, 1953. viii+94 pp., 12 figs., 36 pls., 2 maps. $2.00.

This report concludes the presentation of the evidence from the excavations at Kolomoki in southwest Georgia conducted by Sears for the Georgia Department of State Parks. A final, summary, volume is to be expected. Mound D contained an elaborate series of burials centering around that of a single individual. The whole situation, as Sears points out, is suggestive of elaborate burial rituals including retainer burial. The pottery and other artifacts are equally spectacular, although the pottery is the most bizarre. The Kolomoki complex is related to the Weeden Island, Coles Creek-Plaquemine, and various other mature Mississippian complexes while possessing an abundance of complicated stamped pottery of the Swift Creek tradition. It possibly represents a quite late stage in the development of the burial complex that began far back in the Burial Mound stage.

Mound D had been constructed over a particularly rich, and late, section of Kolomoki period midden. This had been scraped away and 7 flexed burials made. These graves served as the base for a wooden scaffold supported by earth and rocks. The chief burial of a male in a rock and log tomb was placed near the south side of this primary mound with 2 females near the

* Editor's Note: the other papers in this volume were reviewed in AMERICAN ANTIQUITY, Vol. 19, No. 2.

eastern edge. Over the male burial were the remains of a light pole framework that Sears takes to have been a litter. Over these graves a small flat-topped quadrangular mound was raised. A disc-shaped mass of yellow clay was piled over the male burial. Several cremations were made nearby. Long bones, single skulls, and a deposit of at least 64 vessels were made around this flat-topped mound. Many of the vessels were apparently broken elsewhere and taken to the mound. The whole suggests elaborate ceremonies, possibly similar to those of the Natchez. Over this second mound, with the scaffold still in place, a rather heavy addition of earth was made with over 80 cremations and single skulls. On top of the circular mound thus produced a mass cremation took place. The whole thing was covered finally with a thick mantle of red clay.

Chapter 3, *The Burials*, discusses in detail the remains found. They are first described in numerical order, then by burial types, i.e., cremations (11), long bone bundles (5), extended (18), single skulls (40), and mixed types (4). The next part gives a summary of the burials by mound stages with convenient summary charts showing the distribution of the various categories. Finally there is a discussion of the ornaments found with the burials. These consist of conch shell beads, copper cymbal-shaped ornaments, meteoric iron cymbal-shaped ornaments, mica sheets and discs, and pearls. Some comparisons are made between Kolomoki and various Weeden Island sites. The significant points in the burial stratification are listed as: all semiflexed burials were made before the primary mound; the main burial and 2 females were buried after the primary mound was built; all later burials were extended cremations in log outlines, single skulls, or long bone bundles.

Chapter 4, *The Artifacts*, discusses the nonceramic artifacts, dealing largely with the cymbal-shaped ornaments of copper and iron. The distribution of these is traced rather widely in the southeast. Sears, however, does not mention their occurrence at the Bynum Mounds, where they were in some cases definitely not ear ornaments. Sears points out the spread of these ornaments in time from Hopewellian to Late Mississippian. The pearls have a rather long time span and are not especially significant. The long slender stone chisel is a type of presumably ceremonial object that ranges in time from Alto focus to protohistoric Lamar on the Georgia coast. The projectile points, also, do not seem to offer any specific time correlations.

Chapter 5, *Ceramics*, deals with the elaborate and abundant pottery, found largely in the mass deposit. The midden under the mound, Sears believes, is a very late Kolomoki accumulation. It contained Kolomoki Complicated Stamped, Kolomoki Plain, an aberrant incised, some Dallas type rim fillets, St. Andrews Complicated Stamped, and Crystal River Negative Painted. The mound fill contained about the same sort of sherds and is not treated in detail. The mass pottery deposit produced a series of elaborate forms: effigies in the round (seated human, panther, crested bird, fish, and deer); effigies derived from square vessel forms (cat, human, deer, owl, duck, opossum, and unidentified birds); secondary effigies in which there are some effigy features (largely duck, owl, and rattlesnake); abstract forms such as egg-shaped, double forms, etc.; pot and bowl forms modified in various other ways. There were 64 restorable vessels as well as at least 28 groups of sherds that could not be reconstructed but did seem to represent individual vessels. The types include: Weeden Island Plain, Weeden Island Incised, Weeden Island Zoned Red, Carabelle Punctate [sic], Mercier Red on Buff, Oklawaha Plain, and Kolomoki Complicated Stamped.

Chapter 6, *Summary and Conclusions*, is given over largely to the placing of Kolomoki in the Weeden Island time scale. Wakulla Check Stamped is largely absent from the site. The underlying midden below Mound D yielded almost solely Kolomoki Complicated Stamped, yet the mass pottery deposit comprised about 92 per cent Weeden Island types. Thus we find the Weeden Island types in use in the burial ritual after they had gone out of use as a domestic ware. Sears again makes the point that he believes the Weeden Island material present is Weeden Island II in spite of the absence of Wakulla Check Stamped. An alternative explanation would be to place Kolomoki before Weeden Island and to identify the Weeden Island as Weeden Island I. The Kolomoki pots in the mass deposit would then be survivals. In Sears' explanation the Weeden Island pots are the survivals. The simpler explanation would be to place Kolomoki before the Weeden Island occupation. Whatever the final decision on the value of Wakulla Check Stamped as a valid time marker in the Georgia area, it is obvious that the Weeden Island tradition with an elaborate ceramic industry and burial ritual was in existence when mature Mississippian elements were also present.

Sears points out in the final section the apparent similarity of the burial practices used at Mound D with the historic practices described by the French for the Natchez and Taensa. This point has been further elaborated and more definitely stated in an article in the *Florida Anthropologist*. Such things as the seeming presence of litters and a class or caste structured society point to a definite circum-Caribbean type of culture in the area during mature Mississippi times.

The paper concludes with an appendix by Dorothy O'Reilly on the cordage and textile remains. The 36 plates at the end give a very adequate picture of the pottery found, pottery so bizarre that it can be appreciated only through photographs. The reviewer can find very little to criticize in this paper, which has appeared with commendable promptness after excavation. Sears' position, that Weeden Island II, or a late variety of Weeden Island, is present in spite of the absence of Wakulla Check Stamped, seems entirely possible. Kolomoki could also be earlier than Weeden Island and probably only good stratigraphic series will clarify this apparent contradiction. As far as I know, the terminology "mature Mississippi," used here to describe the

full flower of Mississippian culture before the development of the late features, is original with Sears. The concept appears to be a valuable one and will doubtless be used by others.

I find that the figures sometimes place a burden on the reader by lack of directional arrows. Figure 10 actually has north to the top of the page according to the text rather than to the right as indicated in the caption. There is a certain lack of consistency in the pottery summary tables in Chapter 5 in that in 3 cases the actual number of sherds is not given along with the percentages. The plates of single sherds lack scales, making it difficult to accurately judge size. These, however, are minor and possibly trivial objections. So also is the comment that the *University of Georgia Series in Anthropology* now consists of 4 numbers, each of a different format. The report as a whole, however, is a workmanlike job. The reader can not only learn what Sears thinks about the site but can quickly find out exactly what was discovered and supply his own interpretation if he wishes. In the concluding pages the comparison of archaeological material with a ceremonial pattern described in historic documents is a valuable contribution to what Fenton calls "upstreaming." In this case the historic connection between Natchez social structure and burial practices and the archaeological remains at Kolomoki is lost. Together with Fenton's recent paper on the Eagle Dance (reviewed below), this paper indicates that many elements of ritual or ceremonial described in the historic period have had a long existence. In short, the Mound D report is more than site description; it is an attempt at a reconstruction of the total culture as it existed.

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The Iroquois Eagle Dance, an Offshoot of the Calumet Dance. WILLIAM N. FENTON. With an Analysis of the Iroquois Eagle Dance and Songs, by GERTRUDE PROKOSCH KURATH. Bureau of American Ethnology, Bulletin 156, Washington, 1953. 324 pp., 36 figs., 28 pls. $1.50.

Calumet ritualism was once a major sociopolitical mechanism of native North America east of the Rockies; its fossils are familiar to the archaeologist as calumet heads and catlinite objects, to the historian as scraps of narrative from frontier contact. The ritual itself received scant attention from earlier students, despite the abundance of grotesque and curious detail found in historic sources, and despite clear indications in the literature that the ritual forms of the pipe dance must clothe a huge and important structure of myth, nature interpretation, and religious belief. Fenton's monograph, the fruit of 20 years of study and field research, for the first time gives us some account of the vast realm of imaginative belief and religious concept that lies back of the pipe with its feathered-wand stem. It is an exciting book, filled with all sorts of wonderful things, and it is a book of general interest, for Fenton's material is relevant to all of our eastern and Prairie tribes. It is the first study to cast any light on the calumet usage of any eastern tribe. Good ethnological reports are the cream of anthopological literature, for they relate great creative acts of imagination by primitives, and they must also involve great imaginative accomplishments by an author who is able to comprehend and interpret the material he handles. We have too many reports that lie stillborn from lack of any vital breath of imagination, their approach so pedestrian that the impressive cultural realities are never glimpsed. Fenton's book, on the other hand, is a good case for the belief that ethnological research is more an art than a science, good ethnology a creative literary act.

The core of Fenton's study is the cultural material transmitted into our time by Iroquois members of the eagle dance society. However much the functions and contexts of their cult have changed, the symbolism, forms, legend, and significance of eagle dance behavior and belief have not been drastically modified, and these reflect a more ancient ritual complex. This leads Fenton to suggest that principles of functionalism cannot elucidate the modern eagle dance; the basic problems are historical. Fenton presents a tremendous body of comparative data from historical sources and ethnological reports, and has struggled very hard with the formal history and ethnography of the eagle dance-calumet rite. I believe that his respect for these traditional fields of scholarship has led him into some historical errors, most of them involving a too-late date for introduction of calumet ritualism into various parts of eastern North America. This is not the fault of his procedures; on the contrary, if my stricture be justified, it implies a canard on historical and ethnographic studies in general, charging them with low reliability because they are often based on incomplete and bad data. On the other hand, Fenton is able to give significance to otherwise nonsensical scraps of paper data, where he has collected information on similar matters from living sources. His book also serves to show up vast inadequacies of information for almost every tribe and area he mentions. Archaeological data are hardly represented, for only in the past few years have archaeologists been able to give context to fragments of calumet paraphernalia. Yet recent archaeological data contradict the statements of early explorers (and accepted historical explanations) concerning the date and manner of introduction of the calumet rite into the East. Material from the ground demonstrates the appearance of some form of calumet rite (and presumably of eagle rite) in both the Northeast and Southeast in late prehistoric times.

Fenton's monograph is one of those rare books in which one particular aspect of reality is studied from many points of view, through the techniques of field ethnology, personality studies, ethnography, history, musicology, choreography, and sociology. Since my review is for an archaeological journal, I omit mention of many

excellent phases of this multifacet approach, including the magnificent comparative study in music and dance by Kurath. Archaeology is yet another facet of the calumet problem, one which has not yet been utilized. Fenton's magnificent ethnological study of the eagle cite will be read with profit by the archaeologist, and it most certainly should be read for pleasure.

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An Early Owasco Sequence in Eastern New York. WILLIAM A. RITCHIE, DONALD LENIG, AND P. SCHUYLER MILLER. New York State Museum, Circular 32, Albany, 1953. 93 pp., 7 figs., 18 pls. $.75.

This report is the joint effort of the New York State Archaeologist and 2 nonprofessional archaeologists, all members of the Van Epps-Hartley Chapter of the New York State Archeological Association. The publication is the second circular on archaeology issued since Ritchie moved from Rochester to Albany in 1949 and one of several publications emanating from the recent intensified institutional interest in the eastern part of New York State.

In recent years the work of Ritchie has led the way to a more refined and detailed understanding of the cultural sequence in New York. This paper describes the results of a part of that activity and, in addition, makes use of information derived from the work of others in previous years. A brief preface and introduction by Ritchie is followed by his description of the Snell site with sections on excavations, burials and artifacts. Lenig then contributes a short summary of work at and artifacts from the Willow Tree site. This is followed by Miller's report on the Turnbull site. Two ceramic seriation charts and a trait table supplement the brief section on comparisons and conclusions which is contributed by Ritchie. Presentation of this report is skillfully done. Text format is attractive and easy to read, maps and drawings by G. Gillette are of high caliber, and the plates are clear and appropriately labeled. The pottery type seriation chart and the pottery surface treatment chart are bar graphs of the special type used previously by Ritchie to present sequential percentage data.

The study of Owasco culture now being carried out in New York is delineating an important facet of Northeastern prehistory. It is especially important in the light of current theories of cultural continuity which derive both Owasco and Iroquois from earlier local units. The contribution of this report is fairly straightforward and uncomplicated. It consists of the basic description of materials from 3 Owasco sites and a suggested interpretation of them as members of a temporal and cultural sequence in Early Owasco times, showing a certain amount of continuity and linkage with the preceding Point Peninsula manifestations.

The problem of continuity is most provocative. Ritchie summarizes this particular Owasco sequence by stating that, "Although the ceramic trends in general correspond to the hypothetical developmental sequence from Point Peninsula 4 focus to Carpenter Brook focus in central New York, the stone complex has a majority of its affinities with the Owasco culture. In this particular instance, the pottery, generally regarded as the most responsive element to change seems to have lagged behind the associated nonceramic components of the pattern." The Turnbull site reported by Miller is the major key to this situation since Ritchie interprets it to have a predominance of Point Peninsula pottery types associated with distinctly Owasco nonceramic traits. In this regard it is well to remember that the basic work at Turnbull was done in the 1920's and 1930's when Point Peninsula ceramics were known as a relatively undifferentiated entity. Only in the last decade has it become possible to raise this sort of problem, based as it is on detailed pottery types which rely on differences in rim and other decoration for their primary definition. While it can be suggested that the sample of pottery types from Turnbull is extremely small (60 sherds), the types are well established from larger samples known and reported elsewhere.

There is some question raised by the brief discussion of surface finish which would have been avoided by including the data from the Jack's Reef site on the surface finish seriation chart. While this point is not specifically made in the report, these surface finish data do support the more narrowly defined pottery types and Ritchie's interpretation of them as Point Peninsula. Although there were no depth controls utilized in the Turnbull excavation, it seems unlikely that an occupation characterized by Point Peninsula pottery and no other Point Peninsula artifacts could have preceded an occupation characterized by only the nonceramic aspects of an Owasco component.

It is significant that the work of the nonprofessional archaeologists in New York is being recognized, as exemplified in this jointly authored publication. The New York State Museum is to be congratulated for its efforts and this fine report.

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A Foundation for the Dating of Some Late Archaeological Sites in the Rio Grande Area, New Mexico: Based on Studies in Tree-Ring Methods and Pottery Analysis. TERAH I. SMILEY, STANLEY A. STUBBS, AND BRYANT BANNISTER. University of Arizona Bulletin, Vol. 24, No. 3 (Laboratory of Tree-Ring Research Bulletin, No. 6), Tucson, 1953. 66 pp., 5 figs., 4 pls. $1.00.

For many years archaeologists and dendrochronologists of the Southwest have looked forward to publication of the Rio Grande treering charts (differing appreciably from those of the Western Pueblo region) and to a list

covering all dates yet obtained for the area. This bulletin not only covers these 2 major points but also one of at least equal importance — an outline of northern Rio Grande archaeology as far as this is known today. The several approaches provide a technical handbook invaluable to professional workers in the area and of interest to the serious layman.

The lengthy efforts of Stallings in working out the first chronology of ring growth and dates for many of the excavated prehistoric sites and early historic mission ruins of north-central New Mexico is well known to Southwesterners. Preparation of these data for detailed publication was halted when Stallings moved from the Laboratory of Anthropology in Santa Fe, where he had carried on the study over a period of 9 years, to the Taylor Museum for the special purpose of applying the methods of treering dating to the large collection of old Spanish-American religious paintings upon wood and carvings in the round. In 1950 the Tree-Ring Laboratory of the University of Arizona acquired the Laboratory of Anthropology collection of Rio Grande wood specimens. T. I. Smiley, with the aid of Bryant Bannister, under a grant from the Wenner-Gren Foundation, undertook an independent study of the specimens, as is customary before release of dendrochronological data, together with an examination of archaeological specimens excavated since 1940.

The portion of this bulletin devoted to the treering studies opens with a brief discussion of the meaning of symbols and terms used in reporting dates, and the notation that lists of dates for certain sites now appear to cover fewer specimens than formerly because of careful weeding out of duplicate pieces. The dates for some sites are slightly changed from those given in earlier publications, not because of previous errors, but as the result of a few additional rings being found in the meticulous re-examination of every portion of each specimen.

With the aid of Stanley Stubbs of the Laboratory of Anthropology, an outline of information on each dated site is set down, giving dates, type of site, indigenous pottery types, trade wares, excavation and excavators, and a list of references to the ruin. The reader thus has at hand a quick summary by means of which something of the archaeological significance of the dates obtained becomes apparent. Forty-six prehistoric sites and 26 modern pueblos and mission ruins are covered individually and in 2 charts which give the number and range of dates for each.

The next chapter presents a discussion of the measured ring series from A.D. 908 to 1931 in the Rio Grande. The actual measurements on the cross-dated specimens have been read to .01 mm. on a micrometer scale and "standardized" (or put into the form of index figures) through computation of the proportion (percentage) of the actual width for each year to the age-trend line of growth, handled as a running mean. Indices below 100 indicate tree growth to have been less than average, presumably indicating dry years since growth of southwestern conifers has been found to show higher correlation with precipitation than with any other climatic factor. Similarly, indices above 100 presumably indicate damp years. The table giving an index for each year from 908 to 1931 is fundamental for others desiring to do treering dating in the area and likewise for anthropologists interested in relating prehistoric population shifts to fluctuations in weather and hence in farming conditions. The authors summarize the drought data:

> The so-called "great drought" period of 1276 to 1299 is not so severe in the Rio Grande area as in that of Mesa Verde and of Flagstaff according to the various indices. In the Rio Grande area the entire period from 1251 to 1299 was relatively dry, with the worst part being in the 1250's. There are also other periods wherein the relative growth for certain years dropped considerably. These periods include the years from 1445 to 1464, 1469 to 1483, and 1560 to 1594 with the years for 1579 to 1585 showing but very slight growth.

The final chapter of this monograph, Stubbs's "A Brief Summary of Northern Rio Grande Archaeology" presents the first comprehensive and up-to-date statement to be published for this area. The detailed chart of pottery types showing the continuation and changes within certain traditions, their mergings and divergences, actually is based not only upon pottery but also upon accompanying traits, although each phase is here represented by the diagnostic sherd type. Groupings of such types into styles characteristic of time and space relationships, and in many cases tied into the known work of certain Pueblo peoples of the historic period, is the anthropologist's best lead to archaeo-ethnology. That some changes in the details of phase relationships will appear with further work in this area, where surprising new discoveries are being made annually, in no way negates the importance of such an outline of historical reconstruction, a basis for seeing parts in relation to a whole.

One of the best features of this concise bulletin is the large detailed landform map of New Mexico drawn by Smiley and showing site locations. Many an archaeologist of the area will find it most convenient for his own studies. Stubbs's chart showing pottery relationships likewise is of great value for teaching as well as for research. But it is most unfortunate that this and some of the other charts must be attacked with a magnifying glass by any serious student even of fair eyesight. Such a situation, found all too frequently in publications today, seems unfair to the patient compiler of the charts as well as to the reader.

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Salvage Archaeology in the Chama Valley, New Mexico. Assembled by FRED WENDORF. Monographs of the School of American Research, No. 17, Santa Fe, 1953. 124 pp., 23 figs., 48 pls. $6.00.

This monograph covers the results of the partial excavation of two large pre-Spanish pueblos, Leaf Water Pueblo and Te'ewi Pueblo, located in the lower Chama Valley several miles above its junction with the Rio Grande. Both pueblos consisted of several blocks of rooms grouped around a plaza, or in the case of Te'ewi two plazas. From 4 to 7 rooms in each block were excavated to determine the building sequence of the blocks, the plazas were trenched, and 6 semisubterranean kivas and 2 pit houses were also excavated within the plazas or nearby. On the basis of ceramics and other features these pueblos are believed to have been occupied from the 13th to the 16th centuries. Treering dates from 4 rooms, Kiva I, and the North Plaza of Te'ewi Pueblo fall between these centuries and range from A.D. 1305 to 1445, or approximately 55 years later than the initial occupation and 55 years earlier than the period of abandonment estimated on the basis of ceramics.

Like other recent reports on Southwestern prehistory, this one brings together the cooperative efforts of several contributors (in this instance seven), as well as the edited field notes of two field supervisors. These contributions are successfully correlated and assembled here by Fred Wendorf. The authors have set a new standard in Rio Grande archaeology for prompt and thorough publication of excavation results. The work of the 7 contributors is distributed among 5 major parts and 3 appendices, and 3 of the major parts are further subdivided into sections.

Part I by Ralph Luebben and David Brugge describes the environment of the lower Chama Valley, with sections on the geology, climate, flora, and fauna. These sections are descriptive of the present-day ecology and the available natural resources. The geology of the area is described in precise terminology, by means of a summary review of the local formations and their history. In the next section the climate and its role in the ecology is clearly portrayed. The table on the plants collected locally and their uses by the historic cultures, which appears at the end of the section on flora and fauna, is most informative and concise. Here, as elsewhere in this part it is implied that the present ecology is approximately the same as it was when the sites were occupied during the 13th century. This seems to be a reasonable view as long as there is no good evidence to the contrary. In that case, however, it seems to the reviewer that the data on the modern resources would have been more useful had they been more clearly related to the excavated evidence and had it indicated in some manner the extent to which the occupants of the prehistoric pueblos made use of the available natural resources.

In Part II the historical background of the Chama Valley is reviewed by Albert Schroeder. This part contains a short account of the various Spanish expeditions through the Chama Valley and their settlements along the Rio Grande near the mouth of the Chama, as well as a brief review of such controversial issues as the identification of Oñate's first headquarters among the Tewa, whether at San Juan or Santa Clara Pueblo, and the date of establishment and location of the San Gabriel headquarters. Schroeder's main conclusion, "that the Chama Valley was a natural route for trade and traffic between the Rio Grande and the San Juan for certain Indian tribes and the Spanish, rather than a region of settlement in historic times," is well documented and indicates that the main settlement of the Chama Valley (and of the sites under discussion by implication) was prehistoric.

Parts III and IV by Ralph Luebben and Fred Wendorf respectively constitute the site reports proper. These are clear, thorough, and objective descriptions of architectural and artifact details, covering such particulars as masonry, ventilators, fire pits, floors, ceilings, manos, metates, axes, and awls. However, the treatment of the material from the 2 sites is somewhat different. Leubben's study of the Leaf Water Pueblo is almost entirely factual, and with the exception of a discussion of the kivas is lacking in comparative discussion and interpretation. The rooms and the kivas, particularly the most interesting Kiva 2 which had a serpent figure modeled in the clay floor of the fire pit, are most carefully described. Few of the specimens recovered from Leaf Water Pueblo are illustrated; for the remainder, reference is made to Kidder's *Artifacts of Pecos*. Although the use of this device may put some hardship on certain classes of students such as novices who are unfamiliar with the types, its use may be excusable because of the salvage nature of the excavations.

Wendorf's report on Te'ewi Pueblo contains more in the way of comparison and interpretation. It is well illustrated and contains more statistical data such as sherd counts by rooms. There are also valuable data on the distribution of artifact and kiva types. For example, unpublished data on several kivas in the Santa Fe area are given. Furthermore, Wendorf takes full advantage of the more recent methods and accumulated knowledge which other Rio Grande archaeologists have not had. For example the kivas are classified as "big kivas" and "little kivas" and the use of certain floor features is interpreted on the basis of the most recent ethnological information.

The next part, entitled "Discussions and Conclusions," deals with general and controversial issues and is of course most interesting. Wendorf first comments on the lack of sites earlier than Pueblo III in the Rio Grande Valley and then indicates that the rapid decline in population in the Chama Valley after A.D. 1500 was caused by nomadic raids or internecine warfare, as was borne out by evidence of conflict at Poseuinge and in one of the Te'ewi kivas, where the remains of 24 or more individuals were found in a situation suggesting attack and burning of the kiva. He then considers the first of the 2 main topics discussed in this part, the

antecedents and sequels of the eastern Rio Grande cultures, particularly that of the Chama Pueblos, which on ceramic evidence (the Biscuit "B" to Tewa Polychrome series) and more dubious traditional and place name evidence are shown to be culturally and *perhaps* linguistically related to the Tewa. (The reader who is fully aware of the tenuous relationships between language and culture will note carefully the words "perhaps" and "possible" in Wendorf's discussion.) He then questions Reed's derivation of the Tewa from Mesa Verde because of the lack of kivas with Mesa Verde kiva features in the Rio Grande, and because of a gap of several hundred years between the end of Galisteo Black-on-white and the recording of Tewa speaking groups in the Galisteo area.

Of more general interest is Wendorf's second topic, his analysis of the influences from the east on Rio Grande cultural development. Most interesting in this regard is his interpretation of certain elements found at Te'ewi Pueblo as being derived from the east. Some of these are: designs incised on pottery, the beamer type fleshing tool, and the flattened mouth-piece pipe. To this list of traits he adds those enumerated by Krieger as representing possible Plains elements in Pecos Pueblo, such as snub-nosed scrapers, four-edged beveled knives, and shaft wrenches of bison rib. For the most part Wendorf subscribes to Krieger's conclusions and dating, with the exception that he would derive some of these elements from the Lower Loup and Upper Republican cultures rather than the Caddoan. Concerning these elements and their derivation there should not be much disagreement with the possibilities suggested. However, the derivation of the flattened mouth-piece pipe from Tchefuncte or Adena seems quite improbable in view of the disparity of dates and the distances involved.

At the conclusion there are 2 excellent detailed appendices on perishable materials from Te'ewi Pueblo, one by Irene Emory and the other by Earl Morris. These are models of description of this type of material. A third equally excellent appendix by Erik Reed is on the skeletal material, and includes the 24 or more individuals from the burned kiva and 9 other burials or scattered remains. These are described and compared in detail with other Southwestern series. Tables of measurements are included and were also compared where comparable measurements were available. Reed concludes that the Te'ewi individuals may be assigned to the Southwest Plateau stock, and that they diverge from it largely in the same traits as the Pecos crania. He finds that the Anasazi people who occupied the west side of the Rio Grande were "people of the Southwest Plateau type affected to a perceptible extent by admixture with non-Puebloan elements as well as by normal local differentiation."

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Contributions to American Anthropology and History, Vol. XI, Nos. 52-56. Carnegie Institution of Washington, Publication 596, Washington, 1952. v+236 pp., frontis., 145 figs. $6.75 paper, $7.50 cloth.

Geologic Observations of the Ancient Human Footprints near Managua, Nicaragua. HOWEL WILLIAMS. Contrib. 52, pp. 1-31.

Mound E-III-3, Kaminaljuyu, Guatemala. EDWIN M. SHOOK and A. V. KIDDER. Contrib. 53, pp. 33-127.

Conquest Sites and the Subsequent Destruction of Maya Architecture in the Interior of Northern Yucatan. RALPH L. ROYS. Contrib. 54, pp. 129-82.

The Ball Courts at Copan; with Notes on Courts at La Union, Quirigua, San Pedro Pinula, and Asuncion Mita. GUSTAV STROMSVIK. Contrib. 55, pp. 183-214.

Pottery from Chipoc, Alta Verapaz, Guatemala. ROBERT E. SMITH. Contrib. 56, pp. 215-36.

The reader cannot complain about lack of variety in this collection. The papers range in space from northern Yucatan to Nicaragua, cover a time span of at least 4000 years, and embrace the fields of geology, archaeology, and history. For continuity's sake, therefore, I propose to discuss these papers slightly out of order, beginning with Williams' study of Nicaraguan volcanic deposits, then proceeding to the archaeological papers of Stromsvik, Shook and Kidder, and Smith, and ending with Roys's description of Yucatan conquest sites.

In 1941, F. B. Richardson "rediscovered" the presence of human and animal footprints in volcanic mudflows near Lake Managua, Nicaragua, a phenomenon first reported on by Flint in 1884. In an effort to date these prints by geological means, Williams, in 1941 and 1949, made a study of Nicaraguan volcanic activity, and the present paper summarizes his findings, which may be briefly stated as follows:

1. The mudflows — both that containing the footprints and those immediately overlying to a thickness of about 1 m. — resulted from a series of eruptions from the Masaya caldera, 25 km. southeast of Managua. The eruption took place during the rainy season, and the entire series covered only a short span of time, no more than a few months at most.

2. Over the mudflows are strata of pumice, mud, and soil, separated by disconformities and scored by old stream channels, but all of this deposition and erosion probably took place in a short period of time, compared with deposits of similar thickness in nonvolcanic areas.

3. Associated with the footprints are various animal tracks, including those of bison, almost certainly extinct in Central America by the beginning of the Christian era. The only fossil bone found in the mudflows was a deer jaw, belonging to a variety no longer resident in Nicaragua, but resembling closely some present-day Mexican subspecies. No artifacts were found in these layers, although some of the 19th century investigators reported finding stone implements in the mudflows. If these ever existed, they have now disappeared. At present, artifacts are found only in the topmost soil layer.

In conclusion, Williams finds that the evidence will allow him to say only that the footprints are somewhere between 2000 and 5000 years old. Although he fails to say why, the deer jaw bone presumably could not be used to obtain a radiocarbon date. At any rate, these dates, plus the absence of associated artifacts, effectively remove these remains from the list of significant Central American fossils.

Stromsvik's paper describes the 3 superimposed ball courts excavated and studied by the Carnegie Institution at Copan, Honduras. The 2 earlier courts (I and II) coincide exactly in plan and orientation, their only difference being in level, but Ball Court III, although maintaining the same general plan and dimensions, is removed considerably to the north with its long axis twisted eastward. The reason for these alterations is not given in the text, but presumably is connected with changes in or additions to Structure 26, which adjoins the court on the southeast. Ball Court III is best dated at 9.12.0.0.0, but satisfactory dates for the earlier courts are not available, although Stromsvik makes a good case for an early Baktun 9 date for Ball Court I. The paper also includes brief descriptions of similar ball courts at nearby sites in Honduras and Guatemala.

The richness of pre-Classic deposits in the Guatemala highlands is well illustrated by Shook's and Kidder's description of the excavation of Mound E-III-3 at Kaminaljuyú. The discovery that the peoples of this era not only built huge mounds but also maintained a society which felt it necessary to indulge in elaborate tomb burials with grave furniture and human sacrifice is an event of outstanding importance. The present paper, by far the longest in this volume, contains Shook's description of excavations at the mound and Kidder's description of the artifacts encountered in the 2 tombs found therein. Both authors are outstanding in their respective fields. Shook unravels the complex of structures and tombs in E-III-3 with his customary economy and clarity, while Kidder's discussion of the artifacts follows the logical and precise order previously developed by him in his reports on Kaminaljuyú and Uaxactun. Comparative material, almost entirely lacking in this latter section, will presumably be supplied in a forthcoming final report on the pottery of Kaminaljuyú.

Smith's short paper describes in detail the pottery from an isolated refuse pit near Coban. Smith believes, with good reason, that this deposit represents a single ceramic phase, and since Alta Verapaz is notable, at least up to now, for its absence of stratigraphy, any effort to isolate and describe material of this kind will be welcomed by future students endeavoring to establish a complete ceramic sequence here. Through association of some of the finer wares with Butler's sequence from the Alta Verapaz, published in *The Maya and Their Neighbors*, Smith equates his Chipoc phase with Chama 3-4, equivalent to lowland early Tepeu. Also briefly described are pottery vessels from 2 nearby tombs, the date of one being equivalent to late Tepeu, of the other, to Tohil.

I confess to some confusion at Smith's definition of the term *ware*, which, he says, "refers to ceramic groups in each of which form, surface finish, and style of decoration are constant" (p. 224). Surely he does not mean that all of these characteristics are equally similar throughout a given ware, for of course they are not, since form and decoration may vary considerably more than surface finish. As a matter of fact, Smith usually employs the latter alone as a criterion of ware, the other features serving to distinguish subdivisions, or types, this being consistent with normal procedure in pottery classification. And yet he names one ware, "Incised Orange-on-cream." Should this not be a *type* of "Orange-on-cream ware?"

The last paper in this volume to come under review is Roys's survey of conquest sites in northern Yucatan. This study would be valuable enough either as a compilation of 16th century documents describing native towns and temples as they appeared to the Spanish conquerers, or as a description of the way Maya stone structures were reincorporated into Colonial convents, monasteries and churches. In addition, however, Roys locates several towns which were abandoned in the 16th century, describes their historical significance and present appearance, and suggests likely places to dig for Colonial and late pre-Spanish artifacts. Would that every archaeologist going into the field had such a *vade mecum*!

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Indian Tribes of Aboriginal America: Selected Papers of the XXIXth International Congress of Americanists [New York, 1949]. Edited by SOL TAX. University of Chicago Press, Chicago, 1952. 410 pp. $7.50.

Contrary to previous practice, the papers given at the 29th International Congress of Americanists have not been published as such, but in 3 separate volumes, each with its own title. The first volume, called *The Civilizations of Ancient America* and containing all of the papers on the high cultures of Middle and South America, was not included in the assignment for this review. The second volume, *Acculturation in the Americas*, is concerned only with the present-day Indians, although theoretically articles on prehistoric acculturation, e.g., of Navaho towards Pueblo culture, would have come within its scope, if any had been contributed. The third volume, which is the subject of this review, contains the remaining archaeological and ethnological papers, as well as those on linguistics and physical anthropology.

The third volume, then, is a catchall, lacking the unity of subject matter in the first two. Insofar as possible, it is organized geographically, so that the archaeological papers fall roughly into 3 groups, covering the North, the United States, and lowland South America. The last 2 groups include papers on Early Man as well as neo-Indian archaeology.

Papers in the first group by Kaj Birket-Smith and Helge Larsen may be singled out for comment. The former provides an authoritative and comprehensive survey of the current status of the problem of Eskimo origins, including a synthesis of the archaeology; and the latter, a concise summary of the Larsen-Rainey monograph on Ipiutak culture, together with a brief account of the more recent finds. Discussions by Frederica de Laguna and Diamond Jenness, respectively, bring out differences of viewpoint, particularly as regards the relationship of Ipiutak to Old Bering Sea. While Birket-Smith and Larsen consider Ipiutak to be ancestral to Old Bering Sea, their American colleagues argue that the two are contemporaneous, a position which is more nearly in accord with the subsequently obtained radiocarbon dates. There is agreement, however, on the Asiatic origin of much of Ipiutak culture.

The papers on the archaeology of the United States include 4 preliminary reports or summaries of research. Carlyle Smith gives a preview of his American Museum monograph on the archaeology of coastal New York; James B. Griffin presents a discussion of 6 Middle Mississippi ceramic forms, taken from a chapter in the Phillips, Ford, and Griffin monograph on the lower Mississippi Valley; L. Pendleton summarizes the Gallina culture, largely on the basis of Hibben's finds and publications; and Herbert W. Dick discusses the findings at Bat Cave. Dick's paper is probably the most useful and significant of the 4, in the absence of the final report on Bat Cave and in view of the importance of this site for the problems of the origin of corn and the position of Cochise culture.

Two of the papers are theoretical in nature. Commenting on Mexican-Southeastern contacts, J. Charles Kelley proposes a route along the southern part of the Gilmore Corridor and thence eastward through the coastal plain. He suggests that Mexican traits were transmitted along this route by nonagricultural people of the Balcones phase during the course of their migrations to exploit seasonal concentrations of plant foods. In the other paper, Deric O'Bryan makes a closely reasoned survey of the theories that have been advanced to explain the abandonment of the northern Pueblos in the 13th century. He favors the hypothesis of nomad pressure, on the assumption that the Navaho were already in the Southwest, pushing the Pueblo Indians southward, as early as the 12th century A.D.

Volney Jones contributes an interesting paper, largely historical in nature, on the material from the Hemenway expedition as a factor in establishing the American origin of the garden bean; and, finally, John Hall Moss discusses the antiquity of the Finley (Yuma) site from a geological standpoint. Moss's date of 7000 years ago, based upon climatic and glacial sequences, agrees nicely with the subsequent radiocarbon dates for the Horner and Long sites.

There are 2 papers on South America which seem worth mentioning. In "Notes on Venezuelan Archeology" J. M. Cruxent describes recently discovered causeways, pot-holes, and stone walls, thus adding to the types of sites covered by Osgood and Howard in their survey of Venezuela. "Ancient Man in South America" by Theodore D. McCown provides both a succinct historical review of the problem and a critical evaluation of the most recent finds. Despite its pessimistic tone, this article shows clearly the advances that have been made since the author published his first review of the problem in *American Antiquity* in 1940.

As a whole, the archaeological papers in this volume are inferior in number, if not in quality, to those in the first volume, on the Indian civilizations of America. In part, this may reflect the increasing interest of American archaeologists during the past few years in the higher cultures, especially of the Andes, and in part it is probably due to the failure of our European colleagues to pay much attention to the lower cultures, except in the Arctic area.

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Prehistoric Settlement Patterns in the Virú Valley, Perú. GORDON R. WILLEY. Bureau of American Ethnology, Bulletin 155, Washington, 1953. xxii+453 pp., 88 figs., 60 pls. $4.00.

This volume is the fourth major report resulting from the 1946 Virú Valley Project of the Institute of Andean Research, having been preceded by monographs by Ford on the cultural dating of sites investigated, Bennett on the Gallinazo period, and Strong and Evans on the Formative and Florescent epochs. Thus the halfway mark has been reached in the publication of full reports by the 8-unit Project which had as its aim "a coordinated anthropological and geographical study of the human history of a single coastal valley in northern Perú."

Willey's particular field of investigation on the Project was a study of settlement patterns in the Virú Valley throughout the course of its ascertainable prehistory, with objectives, in his words,

> First, to describe a series of prehistoric sites with reference to geographic and chronologic position; second, to outline a developmental reconstruction of these prehistoric settlements with relation to function as well as sequence; third, to reconstruct cultural institutions insofar as these may be reflected in settlement configurations; and, fourth, to compare the settlement story of Virú with other regions of Perú.

Willey credits Julian Steward with the initial impetus for this study, through the latter's "belief that archeology could best place itself in the position of contributing to the interpretation of the nonmaterial and organizational aspects of prehistoric societies through a study of habitation and settlement types." Archaeological investigations with this particular focus and aim, on the scale of the Virú study, have been nonexistent in New World archaeology, and Willey, emphasizing the experimental nature of such a study, proceeds with care and discretion through this pioneering work.

Field work for the settlement pattern study consisted of the investigation of a large sample of surface-exposed sites in the Virú Valley. Willey estimates that the 315 sites cataloged represent something less than ¼ of all prehistoric cultural sites in the valley. Willey's work was carried out in close conjunction with that of Ford, the 2 units together comprising in a sense the Project's surface survey. After preliminary survey and mapping from aerial photographs, the 2 investigators visited each of the cataloged sites for more intensive study, Ford's task being the cultural dating of the sites primarily through his technique of seriational analysis of pottery collections from the surface, and Willey concentrating on settlement pattern and other habitation and architectural features.

Since all other archaeological units of the Virú Project restricted their investigations to the excavation of partial segments of the valley's prehistory, only the reports of Ford and Willey have the whole known prehistoric sequence of the valley as their purview. With Ford's report largely concerned with ceramic analysis and classification, the present volume by Willey, in its detailed architectural and settlement data supplemented by summary characterizations of each of the successive cultures in the valley's archaeological sequence, with an attempt at some degree of interpretation of the cultural processes involved, may be considered as the broadest in scope of any of the reports that have appeared or are yet to come, unless the tentative final synthetic report by all the members of the Project becomes a reality.

The introductory chapter of the report is an exposition of the methodology of the settlement pattern study. Here Willey gives a detailed description of the intensive use of aerial photographs by him and Ford in general orientation, location of sites, and site mapping. The work of the survey was immeasurably facilitated by this device. Many admirable field techniques at all stages of procedure were worked out by the Virú Valley Project, and this particular one might well serve as a model for future surface survey, settlement pattern, mapping, or other studies involving the cataloging and description of sites, where aerial photographic coverage is available.

At the outset of investigation Willey considered sites as falling into 4 functional categories: 1) living sites, 2) community or ceremonial structures, 3) fortified strongholds, and 4) cemeteries. Public works such as canals and roads were regarded apart from these categories, but described in connection with such sites as they were relatable to. As field work progressed and data accumulated, Willey then formulated various descriptive types and subtypes within the functional categories: Scattered Small-house Village, Agglutinated Village, Compound Village, etc., within the living site category; Community Building, Pyramid Mound, etc., within the community and ceremonial structure category; and Hilltop Redoubt, Hilltop Platform, Castillo Fortification Complex, etc., in the fortified strongholds category.

Dating, or rather cultural identification of sites, was almost exclusively by ceramic association; here Willey relied heavily on Ford's surface collection analyses. It is significant that even in a work of this type where the basic data investigated were architectural and settlement features, the ultimate reliance for cultural identification was on pottery, and, in fact, some of Willey's architectural information was provided by ceramic reproductions of house types. Of course, knowledge of Peruvian architectural data is as yet too scanty and unsystematic to allow their use as the major criterion for defining culture periods and their sequence, or even for the direct identification of sites, but there are also indications in Willey's work that such features are not the sensitive registers of culture change that pottery is. Certainly settlement studies can eventually provide answers to a higher order of anthropological problems than ceramic analyses, but the evidence throughout Willey's work indicates that the spadework cannot be avoided.

The first chapter concludes with a discussion of the problem of the cultural identification of sites investigated simply by surface survey, and the frequent difficulty of determining the original pottery-cultural association of these sites in a small area with large populations, a series of cultures, and 2000 years of ceramic development. These associational problems were such that Willey's final word on settlement study methodology is advice to future students to be prepared for at least some detailed excavation.

The next chapter, "The Virú Valley: Environment and Inhabitants," gives a brief but comprehensive background statement on geography, geology, climate, and present-day population, as well as a summary of the history of the valley since the conquest, and a concise descriptive outline of the prehistoric sequence of cultures that has been established through years of archaeological investigation, culminating in the work of the Virú Valley Project. The chapter is an excellent presentation of a variety of data on the valley, and concludes with an up-to-date consideration of radiocarbon and other estimated datings of the valley's archaeological sequence.

The great bulk of the volume is taken up by the chapter "The Prehistoric Occupation of Virú," a detailed presentation of the data gathered on the 315 sites surveyed in the valley, provided with a large series of site maps, and arranged first by cultural period, and within the period by type and function. The chapter is a mine of information covering a practically complete developmental sequence of coastal Peruvian prehistoric architecture, and used in conjunction with the appendix listing the Virú sites in numerical order, the Peruvian specialist also has at hand an invaluable descriptive site catalog facilitating and complementing the study not only of the other unit reports of the Virú Valley Project, but those of previous investigators there as well. This section of Willey's work is the largest single body of scientific information on prehistoric Peruvian architecture and settlement patterning that exists in the litera-

ture, and is a great contribution on a subject heretofore neglected or at best haphazardly reported.

Willey defines the next chapter, "The Development of Virú Settlements: A Reconstruction," as the summary of and conclusions from the settlement pattern data. It is largely a recasting of the basic data into narrative form, chronologically arranged, making clear the developmental trends in the various types of architecture and their patterning throughout the valley's prehistory. In briefest outline, these trends were as follows: A few subterranean houses and villages of small conjoined rooms are the only architecture known from the very primitive and preceramic Cerro Prieto period, with nothing found that could be interpreted as ceremonial building or public works. In the succeeding Chavinoid Guañape period in the valley, community or ceremonial buildings, simple temples or enclosures, are first found. Dwelling sites are of the scattered small house type. These Cerro Prieto and Guañape period sites stick close to the beach, as one would expect from predominantly fish-subsisting cultures, although the introduction of maize in the Middle Guañape subperiod allowed a move inland to some extent. The White-on-red Puerto Moorin period shows rather dramatic advancement over the earlier cultures, with the introduction of a number of features which remained basic to succeeding cultures in the valley — pyramid mounds, hilltop redoubt fortifications, agglutinated villages, the first clear indications of warfare, the probable experimental beginnings of irrigation, and a major increase in population, evidenced by a much larger number of sites than previously. Willey's data on this little-known and unspectacular White-on-red period manifestation indicate an important role for that culture in the formation of patterns typifying later high cultures in Peru, and suggest the need for much more investigation of its nature and extent.

The succeeding Gallinazo (Negative) period is the time of great development and working out of the forms adumbrated in the preceding Puerto Moorin period, the construction of vast irrigation systems, large agglutinated villages, great hilltop "castillo" fortifications, and a continuing development of mounds, a long and stable period that Willey calls the "golden age" of Virú prehistory. The brief Huancaco (Mochica) period in the Virú Valley is the culmination of more or less autonomous regional development, the "Florescent" or "Classic" stage, artistically excellent, and with an extreme nationalistic quality. Although probably representing an invasion into Virú from neighboring valleys, in architectural features and settlement patterning Huancaco shows only a continuation of earlier traditions in the Virú Valley, and no great advancement over the Gallinazo forms.

Following the Huancaco period, Willey found the sharpest break in the total developmental trend of culture in the Virú Valley. With the Tomaval period, mound building, heretofore expressive of local politico-religious tradition since its inception in Puerto Moorin, declines. The trend in dwelling sites, which had previously been from small scattered houses into larger and larger agglutinations, alters into a quite different compound settlement type. The great "castillo" fortifications, a development from the early simple Guañape hilltop platforms, and utilized in both Gallinazo and Huancaco times, are abandoned. Similarly, in ceramics a sharp stylistic break is found. Willey equates this interruption of relatively autochthonous local development by strikingly new forms with the Tiahuanaco spread over large portions of Peru, and the imposition of these new forms and traditions from the Highlands onto the Coast.

Following the Tomaval period, the Virú Valley manifestations of Chimu (La Plata) and Incaic (Estero) culture, in architecture and settlement patterning follow closely the lines of the Tiahuanacoid pattern, with no major new features in that valley. Although sites are fewer, and the Virú Valley seems to have become an unimportant backwater in these post-Tiahuanaco periods, the settlement data offer an indication that the Chimu and perhaps even Incaic periods owe a larger part of their heritage to forms laid down by the Tiahuanaco conquest than has been credited.

Serving to set the stage for the next section, this chapter concludes with a discussion of community patterning, where Willey considers the distribution of sites in the valley in all periods, the grouping or clustering of individual sites, the growth of larger communities, orientation around ceremonial centers or "capitals," and the shifts in population concentrations from one part of the valley to another from time to time. These features are graphically illustrated with a series of maps.

The chapter "Settlements and Society" is what Willey calls an "inferential essay," wherein he interprets the data previously presented to deduce facts of population size and growth through successive periods in the Virú Valley, with an attempt at explanation of growth and the movement of population concentrations through time in terms of a developing irrigation technology, defense requirements, and the maximum support potential of the valley. Also considered are certain sociopolitical phenomena suggested by the data, principally the governmental forms implied by the necessity for social control in the construction of large irrigation projects, and cities in the nature of ceremonial centers or "capitals." Willey's inferences are cautiously stated and unexceptionable. However, although the chapter is the only interpretive section in the volume, it is very brief, and in view of Willey's avowed objective of cultural reconstructions, has a parsimonious quality. For such a wealth of data, the inferences drawn as to the nonmaterial aspects of the societies represented are quite few and curiously restricted. For example, the field of social organization is notably untouched. Also one feels particularly that the order of phenomena here investigated by Willey, with their patent implications for the reconstruction of economic, social, political, and religious institutions, would lend itself well to the fuller

appreciation and support (or denial) of the several functional-developmental or evolutionary schemes postulated in recent years for the prehistoric culture sequences of the Andean region, but Willey barely relates either his data or interpretations, if at all, to those schemes.

On the other hand, this kind of criticism is only indicative of the great value of the work in presenting a large body of data of a new kind in Peruvian archaeology, which opens the possibilities of a much more penetrating understanding of cultural institutions and processes in the Andean area. Willey pleads that the study is experimental, and it is perhaps with that caution in mind that he has refrained from extensive inference or speculation in this first work of its kind.

The final chapter, "The Virú Valley in Peruvian Prehistory," places the settlement pattern data in Virú in relation to the rest of the country. The chapter amounts to a summary of the present knowledge of Peruvian prehistoric architecture, very valuable in itself, and serves not least to point up that the present work is unique in the advancement of knowledge of this phase of Peruvian archaeology.

The work is excellently organized, with careful cross-referencing, summaries and recapitulations at all stages of presentation, and a wealth of site and valley maps. A series of plates, indifferently reproduced, illustrates the major architectural types in the valley.

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The Civilization of the Maya. J. ERIC S. THOMPSON. Chicago Natural History Museum, Popular Series, Anthropology, No. 25, 5th edition, Chicago, 1953. 96 pp. $.75.

This is the fifth edition of a well-known handbook, first published in 1927. In accord with Museum policy the text has been revised for the most part, rather than entirely rewritten. I have compared this edition with the second edition, published in 1932.

The general appearance of the handbook has been considerably improved, and the use of calendered paper has allowed the illustrations to be included in the body of the text. Changes and additions to the illustrations have provided a well-chosen coverage. The apportioning of space by subject matter has been scarcely changed; the greater part of the handbook is based on documentary and ethnographic material. Archaeological discoveries have necessitated a rewriting of the historical account (12 pp.), Thompson's recent work on Maya hieroglyphics (*Maya Hieroglyphic Writing: Introduction*, Carnegie Institution of Washington, 1950) must have suggested the rewriting of his chapter on religion (11 pp.). The other sections of the book show minor changes and additions which give evidence of careful and complete revision. The text is up to date.

The author cannot be fairly criticized for faults in relative emphasis of subject material in a text which has not been completely rewritten for 26 years. In general the text seems to me long on mythological and episodic account, short on culture history, settlement patterning, economy, and on material culture in general. There has also been little effort to dissect historical developments from the intricate mass of religious myth and ritual which characterized the conquest period. That these materials represent the results of Mexican mainland influence on the Classic-stage Maya is unquestioned, and Thompson has long held a leading position in efforts to unravel this tangle.

The Civilization of the Mayas can be recommended as a good first reading on the subject. Thompson's recent volume on the Maya (*The Rise and Fall of the Maya Civilization*, University of Oklahoma Press), gives a clearer view of his present interests and approach.

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Uma Análise Estilística da Cerâmica de Santarem. FREDERICO BARATA. Extracted from *Cultura*, No. 5, Instituto de Antropologia e Etnologia do Para, Brasil, 1953. Pp. 185-205, with 75 figs. on 33 pls.

Long surviving Portuguese conquest and missionary contact, the Tapajó Indians of the middle Amazon region maintained their pottery art unchanged to the 18th century. In a brief text accompanying an extensive set of illustrations of pottery vessels and ceramic designs from Santarem (cf. *Bull. Univ. Mus.* 6-2, Philadelphia 1935), Barata discusses the ware from a stylistic or aesthetic point of view, taking up in particular 5 animals which are frequently represented and which inspired the geometrical designs — snake, frog, owl, turtle, and wildcat; anthropomorphic figures are also treated.

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Revista Colombiana de Antropología, Segunda Época. Instituto Colombiano de Antropología, Bogotá.

Government-supported anthropology in Colombia was reorganized in September, 1952, with the creation of the Instituto Colombiano de Antropología to replace the older Instituto Etnológico Nacional and the Servicio Arqueológico Nacional. The new Institute initiated a program of publications in June, 1953, with the appearance of Vol. I, No. 1, of the *Revista Colombiana de Antropología*, replacing the earlier *Revista del Instituto Etnológico Nacional* (4 vols., 1945-1950) and the *Boletín de Arqueología* (3 vols., 1945-1951). The continuity between the old and new series is suggested by the phrase "segunda época" added to the numbering of the

new *Revista*, the older journals being regarded as, in a sense, an earlier series.

The first volume of the new *Revista* (Vol. I, No. 1, 1953) contains no archaeological articles, but the second (Vol. II, No. 2, 1954) has 2 important ones. Julio César Cubillos and Victor A. Bedoya report on a refuse site in the Magdalena Valley in Tolima (Arqueología de las Riberas del Río Magdalena, Espinal-Tolima, pp. 115-144, 8 pls.), and Gerardo Reichel-Dolmatoff describes the architecture and pottery of the famous site of Pueblito in the Santa Marta area (Investigaciones Arqueológicas en la Sierra Nevada de Santa Marta, partes 1 y 2, pp. 145-206, 13 pls., map). The quality of Colombian archaeological work is commendably high at present, and other important contributions may be expected to appear in this series.

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The Conquest and Colonization of Honduras, 1502-1550. ROBERT S. CHAMBERLAIN. Carnegie Institution of Washington, Publication 598, Washington, 1953. vi + 254 pp., 4 pls., map. $3.50 paper, $4.00 cloth.

This work is a companion study to the author's *The Conquest and Colonization of Yucatan, 1527-1550* (Publication 582, 1948). Both works deal with activities of Francisco de Montejo, in whose career Chamberlain is particularly interested. The emphasis throughout is on Spanish politics and military affairs, the Indians being very much in the background except during the general revolt of 1537-39. There is no discussion of archaeology. The book will, however, be a valuable reference for anyone working in Honduran archaeology or historical ethnology since it gives a good account of the chronology and nature of the Spanish conquest.

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Palenque, Una Ciudad Maya. LAURETTE SÉJOURNÉ. Fondo de Cultura Económica, Mexico, 1952. (Translated from the original French.) 89 pp., illustrated.

The author of this small but handsome book assisted Alberto Ruz in his work at Palenque in 1951 and thus has been involved to some extent in the exciting discoveries that have been made there during the last 5 years. She is not reporting on these discoveries in any systematic way, but is rather communicating her impressions of Palenque as a ruin and as one of the most beautiful and provocative of Maya sites. The book is really a verbal and pictorial essay on Palenque and on Maya civilization as a whole with various comments on the history of the Maya, on the sculptures, and on the nature of Maya society.

The book is intended primarily for the general reader and can have only limited interest for the specialist. Of most value for the latter are photographs of some of the recently found sculptures of Palenque and certain views of the ruins and the surroundings not available elsewhere.

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Workshop Notes, Papers 1-8. Textile Museum, Washington, 1950-1953. 4 pp. each, with illustrations. $1.00 each.

In the Southwest, and in most other archaeological areas of the New World, detailed textile analysis has not kept up with the number of specimens recovered in recent years; there is also a wealth of unstudied material in museums which has been collected over many years. This situation is due, in part, to the unwillingness of many archaeologists to learn the superficially complex terminology and methods of textile analysis, and to the limited time of the consultants who are already skilled in this field. In the Southwest, there have been surprisingly few detailed textile analyses published, in spite of the large amount of material available. Some of the notable examples of such studies will be found in the works of E. W. Haury, Lila O'Neale, C. L. Tanner, and Kate Peck Kent, who is now completing research on museum collections of Southwestern textiles. Some studies of ethnological collections, such as those by Charles Amsden and H. P. Mera, are often important for clarification of both textile techniques and archaeological problems. There are also important studies of archaeological material for the Andean area by Lila O'Neale and Junius Bird, and a few others. Generally speaking, European studies of archaeological textiles seem in advance of ours.

In recent years important aids to textile analysis have been derived from the textile industry; for example, use of the terms "S-twist" and "Z-twist," rather than the perennially confusing "left" and "right" or "clockwise" and "counterclockwise," establishment of descriptive terms for degree of twist of yarns, and standardization of terminology for the various kinds of weaves (see publications of the American Society for Testing Materials). Recently many advances have been made in special aspects of textile analysis by borrowing techniques from fields such as physics, chemistry, and botany.

However, little has been published concerning methods of textile preparation and analysis specifically oriented toward archaeological materials. A new series of publications (begun in 1950) which will prove to be of considerable importance to archaeologists is reviewed here. At the present time, 8 numbers have been published. These include: No. 1, "Cleaning and Mounting Procedures for Wool Textiles," by F. S. Greene; No. 4,

"Procedures for Cleaning Cotton Textiles," by E. Touceda; No. 5, "Rugs: Preservation, Display and Storage," by G. H. Meyers; No. 7, "Rug Analysis: Discussion of Method," by N. E. Hunter. In these 4 papers, instructions for preserving textiles are clearly and carefully given, aided by a series of photographs showing processes and results and a list of supplies needed. The need is emphasized of keeping a record of the history of the preservative treatment each piece has had. The papers by Meyers and Hunter, while specifically on care and analysis of rugs, contain valuable information that can be applied to other kinds of textiles. Paper No. 8 is "Preservation of Dated Tiraz Fabrics," by F. S. Greene. The tiraz fabrics presented several difficult and significant problems, and their solution is carefully recorded. The methods of preservation, analysis, and cataloging employed by the Textile Museum seem to be quite thorough and easily adaptable to the requirements of other organizations.

Papers 2, 3, and 6 are "Textile Analysis: Early Techniques in Egypt and the Near East," in 3 parts, by Louisa Bellinger. These are an excellent introduction to some of the purposes and methods of detailed textile analysis, and might well be read for orientation purposes by those beginning such studies, or those who want to be convinced that such detailed analysis is worthwhile. Emphasis is placed on the physical properties of the 4 principal fibers, cotton, wool, linen, and silk, their influence in determining the various weaves developed in the areas where the different fibers were predominant, and the relation of these weaves to the loom types. The interrelation of these factors and their importance in historical studies are discussed. An article which may serve as an introduction to this series and as a general statement of purpose, policy, and method, is "The Significance and Technical Analysis of Ancient Textiles as Historical Documents," by René Batigne and Louisa Bellinger, *Proceedings of the American Philosophical Society*, Vol. 97, No. 6, pp. 670-80, 1953.

It is hoped that this clearly and compactly written series will remove much of the mystery from textile analysis and preservation. The papers already published help make it possible for archaeologists to study their own materials with a minimum of time spent in learning techniques by trial and error. Present deficiencies in coverage, and future refinements in techniques, will doubtless be taken care of in forthcoming issues. While by no means all problems are solved for the beginner in this series, these papers, if used in conjunction with other works, such as the many European studies and those published by the authors mentioned in the first paragraph, should make it possible for more valuable historical and cultural data derived from textiles to appear as archaeological reports are published.

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Early Man in the Eden Valley. JOHN H. MOSS, in collaboration with KIRK BRYAN, G. WILLIAM HOLMES, LINTON SATTERTHWAITE, JR., HENRY P. HANSEN, C. BERTRAND SCHULTZ, and W. D. FRANKFORTER. Museum Monographs, The University Museum, University of Pennsylvania, Philadelphia, 1951. 124 pp., 32 figs., 9 pls. $1.50.

This publication on the Finley site and surrounding terrain south of the Wind River Mountains in southwestern Wyoming is already so well known among archaeologists that this belated* review may seem needless. As a demonstration of geological field work done to establish the position of an early man site in Late Quaternary chronology, it is the best example we have in this country. Along with Hack's *The Changing Physical Environment of the Hopi Indians* this publication comes about as close to being a manual of problems and procedures in a complex situation as one can obtain. Oddly, there is no textbook in geology which develops the late-glacial and post-glacial field problems in any way comparable to these monographs.

The dedication is to the memories of the late Edgar B. Howard and Kirk Bryan, which brings to mind a discussion I had with Bryan about a year before his untimely death. He had come to Texas in the summer of 1949 to visit some early man sites and examine some of our terrace problems. On one of our long drives we got onto the subject of "correlating" geological phenomena and the archaeological materials connected with them. It was Bryan's insistence that none of our problems could be solved "without mapping, mapping, and more mapping, until you begin to know something about the topographic history of the area in which the site lies." He also insisted that too many "correlations" are always being made with few facts to support them, and that field observations should be accumulated without bias as to how they might fit into preconceived frameworks. He also spoke at length about the amount of terrace mapping that had to be done to estimate the geological position of the famous Lindenmeier site. It was only on carrying the terrace mapping some 45 miles upgrade into the Rocky Mountain valleys with moraines that he could make a tentative correlation with glacial chronology. The Lindenmeier Folsom complex then seemed to belong between Wisconsin III and IV, "if one insists on using such terms." I then said, "Whatever the terminology, you at least are sure that Folsom should go before the last major ice advance?" Bryan's answer was characteristically forthright: "Hell no, I only *think* so now, until we find out more about those mountain glaciers."

This admirable attitude is reflected in Bryan's foreword to the Eden Valley monograph. Referring to several early man localities in the western states, he says that in dating "they all suffer from the same uncertainties because all rest on a similar argument." This argu-

* Editor's Note: Krieger was asked to take on the review after it had been in other hands for more than 2 years.

ment is that geological columns observed in areas never glaciated can be directly tied into those of formerly glaciated areas by simple assumptions, such as: valley-filling occurs during glacial ages, due to prevalence of a "pluvial" climate, and, conversely, valley-cutting occurs during interstadials. Bryan would readily admit that the reverse could be true, or that one assumption might work under one set of conditions but not under others, hence the need for extensive mapping and the tying together of different kinds of field evidence before any climatic inference may be drawn.

Eden Valley provided ideal conditions for testing these strictures. The terraces, sand dunes, and pond deposits provided different kinds of clues to the past climate and by mapping were tied into moraines in the Wind River Mountains. The table on pages 82-3 summarizes the observations and inferences, placing the bison bones and artifacts in a "moderately wet" period during which the Parker Terrace was formed. This was preceded by an "arid" period during which the Middle Sand was deposited by wind activity. (Satterthwaite, in his section on the artifacts, concludes that those in place were all from this Middle Sand, but the chart has them after this, in the "moderately wet" period.) Schultz and Frankforter tentatively assign the bison remains to *B. occidentalis* Lucas, the same species found at the original Scottsbluff Bison Quarry in western Nebraska, and elsewhere in early man sites in the Great Plains, where it is sometimes called *B. taylori*.

An estimate of 7000 to 9000 years ago is made by Moss for the "moderately wet" stage, which is perhaps acceptable for the artifacts and bison too. Radiocarbon dates had not been obtained on the Finley site but this estimate agrees well with 2 radiocarbon determinations on the Sage Creek site near Cody, Wyoming, about 175 miles north of Finley. Two runs on University of Chicago sample 302 gave 6619±350 and 7132±350 years, an average of 6876±250 years ago. Sage Creek was an occupation site, Finley only a bison "kill" so far as can be ascertained; and while there are differences in their artifact inventories for this reason, both sites have produced a number of points of the Eden and Scottsbluff types (formerly included in a "Yuma" category).

Passing to the broader correlations, it will be well to remember Bryan's warnings about how little we know, either of the Wisconsin glacial substages in the Rockies or how to correlate field observations with glacial chronology. The present paper gives 5 Wisconsin advances, numbering them W1 (Iowan), W2 (Tazewell-Cary?), W3 (Mankato), W4 (Cochrane), and W5 which is equated with the Neoglaciation of the Middle West — that is, the rebirth of glaciers in Antevs' Medithermal Age which Antevs begins about 4500 years ago but others begin at various times from 2500 to 1200 B.C. The "moderately wet" stage, formation of Parker Terrace, artifacts, and extinct bison are thus all aligned with what is called W4 and Cochrane, the 4th and last major advance of Wisconsin glaciers. This will come as a surprise to many of us, as it has appeared lately that Folsom remains were to be correlated with the last major advance (called Mankato by some geologists, Cochrane by others), and that the artifacts of the "Yuma" complex are later than Folsom and therefore post-W4. It may be noted on the charts on pages 64 and 82-3 that Tazewell and Cary are combined into a single major advance (W-2) while W3 or Mankato is applied to 2 ice advances separated by a "somewhat drier" interval. I suspect that this dual role for Mankato has much to do with making W4 Cochrane and requiring that the "moderately wet" stage and Finley site artifacts be equated with a full glacial advance.

It is very difficult for an archaeologist to keep up with the geological terminology on glacial chronology. The constant shifting of "Mankato" and "Cochrane" (although these terms may be used consistently by individuals) make it almost impossible to discuss the subject of human remains and artifacts with glacial stages in terms that will satisfy everyone. "Cochrane," for example, is often not included at all within the 4 major advances, as it was confined to Canada and represents a much lesser advance than Mankato, which usually holds the role of W4. Cochrane may not have a number at all, or it may even at times be used for "W5," the rebirth of glaciers a millennium or 2 before Christ.

Twenty-eight artifacts have been found at the Finley site. It is amazing that the publication under review contains no descriptive section on them whatever. Pages 103-9 are concerned solely with their association with the Middle Sand, while the table on pages 82-3 places them after the deposition of this sand. Two photographs of artifacts appear as Figures 1 and 2 in Plate 1, but no connection is made between the photographs and the specimen numbers. A table of measurements is reproduced from an earlier paper, but does not cover all the artifacts. Since I had to grub for this information myself, it may be worth the space to report the findings.

What artifact data there are may be found in 2 very brief papers published shortly after the discovery of the site in 1940. Both are in AMERICAN ANTIQUITY, the first by Howard, Satterthwaite, and Bache in 1941 (Vol. 7, No. 1, pp. 70-4) and the second by Howard in 1943 (Vol. 8, No. 3, pp. 224-6). Putting these together with the notes in the present monograph, the 28 specimens should be grouped as follows: A-1 to A-5 were found by Finley and Cook in test excavations in the spring of 1940; A-6 to A-12 appear to be the 7 specimens found by Finley *before* he and Cook dug there; A-13 to A-19 are those found by Satterthwaite and Bache on the University Museum expedition of 1940; and A-20 to A-28 were excavated by Howard for the Museum the following year.

The 1941 paper had a tabular description of specimens A-1 to A-19 and a photograph of 8 of them (Pl. 10) identified left to right as A-15, A-19, A-12, A-7, A-17, A-18, A-2, and A-1. These numbers can be used on the present Figure 1, which is unlabeled. The 1943 paper had another tabular description, this time of artifacts A-1 to A-5, A-14 to A-19, A-21 to A-25, and A-28, and

a photograph (Pl. 11) of 3 specimens not identified in any way, not even by site, and although none is fluted the caption reads "Fluted Points." One can, however, see that (*a*) on this plate is A-15, the first specimen on the left in the 1941 plate; (*b*) and (*c*) cannot be identified except by measuring the photograph and this proved indefinite. Howard does not explain the gaps in the second table nor say anything whatever except that the artifacts were all "in place."

It is hard to believe that the present monograph simply reproduces the 2 pictures with no comments, no identifications, no scale, and not a single artifact description. Measurements but nothing else can be gained from the 1943 table, here reproduced on page 104, but this omits 11 specimens. Seven of these can be picked up in the 1941 paper (A-6 to A-12), but the other 4 (A-13, A-20, A-26, and A-27) are still missing. As for scale, the present Figures 1 and 2 both contain A-15, a fine, narrow example of the Eden type, 103.5 mm. long.

Satterthwaite refers to all 28 artifacts as "points" without qualification. The 1941 tabulation, however, identifies the first 19 by a number of terms: "projectile point," "knife," "projectile point or knife," "tip of point," "base of point," etc. Only 3 are specifically identified as "projectile points" and 2 others as "base of point," but even here there are obvious errors. The specimen called A-19 on Plate 11 is a beautiful, complete projectile point similar to A-15 but is called a "base of point" on the table. A-7 and A-17 are called "knives" on the table but are shown as very handsome projectile points with slightly incut stem edges on Plate 11 — provided the right catalog numbers were used. A-1, A-2, and A-18 may be "knives" but on Plate 11 they look like projectile points with the stems broken off; the same may be true of other artifacts called "knives" but not illustrated. There is no telling what A-20 to A-28 are because although they are measured on the 1943 table, this table has no classifications.

It is thus impossible to discuss the typology or meaning of the artifacts from one of the most important early man sites in America. The 2 photographs show what we now call Eden and Scottsbluff points, plus one with wide shoulders which may be an extreme Scottsbluff variant or perhaps some other type. But if some specimens are really knives with biface chipping we cannot tell the frequency of any of the different groups. The conclusion on page 109 is that "all" came from the Middle Sand, but 9 found by Howard in 1941 (A-20 to A-28) and 7 by Finley (A-6 to A-12) are not included in this statement, and Howard himself seems to have exempted A-13 from the "in place" generalization. This leaves no more than 11 out of 28 to be included in the "all" statement although Howard's A-21 to A-25 and A-28 might be added. And what about "knives" *versus* "projectile points" in the "in place" category?

I cannot help wondering how such an otherwise thorough monograph could have been sent to press without a description or classification of the artifacts. In a site of such importance there is no reason not to illustrate all the artifacts and publish in full the field data on each one. The archaeological profession needs this information and the University Museum should provide it in another paper. The sooner the better.

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NOTICE

The committee for the Wendell C. Bennett Memorial Fund wishes to thank all of those who contributed so generously to this undertaking. As of September, 1954, a sum of over $6,000 has been deposited to the fund for aid in the education of Dr. Bennett's daughter, Martha. This fund has been legally established in the state of Connecticut under the administration of three trustees: G. P. Murdock, Frederick Johnson, and G. R. Willey.

Gordon R. Willey, Chairman
Bennett Memorial Fund Committee

NOTES AND NEWS

EARLY MAN

During the first half of April, 1954, E. H. Sellards, Director of the Texas Memorial Museum, conducted further exploration of the Lubbock reservoir site, where the only radiocarbon date on Folsom artifacts had been previously obtained. More Folsom points were discovered in the same layer but details are not yet available. The period April 21 to May 31 was spent by Sellards at the Blackwater Draw ("Clovis") site in eastern New Mexico, where he tried to recover as much information from this famous site as possible while a gravel contractor was destroying the rest of it. More scrapers and a hammerstone were recovered from the brown sand wedge into the mammoth-bearing gray sand, and more Folsom points were found in the overlying "blue clay" diatomaceous deposit. Sellards was assisted by Oscar Shay and Jim Warnica, amateur archaeologists of Portales, and by Otto Schoen and John Kreibel of the Museum staff.

On June 1st, the Dirección de Prehistoria of the Mexican government's Instituto Nacional de Antropología e Historia began excavation to clear the remains of a second mammoth at Iztapan, 35 km. northeast of Mexico City in the dry bed of Lake Texcoco. This, like most of the Mexican mammoth remains, was found by engineers digging drainage ditches; it was about 400 m. from the mammoth now known as Iztapan No. 1 (see article by Aveleyra and Maldonado in AMERICAN ANTIQUITY, Vol. 18, No. 4, pp. 332-340, 1953). The geological situation of Iztapan No. 1 and No. 2 is identical. One foreleg of No. 2 had the foot bones in articulation, pushed vertically far down into the greenish clay of the Upper Becerra formation, which shows beyond question that the beast had been driven into a deep sticky mud to entrap it before killing. Both tusks were present, very large and long, with the whole skull inverted. Three artifacts were in place but these are unlike the 6 found with Iztapan No. 1. The first is a leaf-shaped projectile point of reddish andesite, with straight base, edges unsmoothed, and a length of 81 mm.; although it is of the general shape of Angostura points of the Great Plains it is not a perfect example of this type, just as the projectile point from Iztapan No. 1 mammoth is closer to the Scottsbluff type than any other, but is somewhat deviant. Artifacts 2 and 3 were broken but also are leaflike, with the broadest part in the middle. Both are of flint or chert. No. 3 may have been a biface knife, as it is larger and more crudely chipped than the others. Aveleyra writes that both artifacts 2 and 3 would "in Europe immediately be classified as Solutrean laurel-leaf points." The same might be said of many of the projectile points now being classified as the Angostura type in the Great Plains (also called the Long type). An early publication is promised.

On July 11, *Time* and *Life* magazines carried the announcement of a human skull found near Midland, Texas, in a Pleistocene deposit antedating the 10,000 year old Folsom horizon. The discovery was actually made in June, 1953, when Keith Glasscock, a pipeline welder and amateur archaeologist, was searching for artifacts in a sand blowout on the Scharbauer Ranch 6 miles south of Midland. Finding parts of a human skull being exposed by erosion, he picked up the parts likely to blow away and left the remainder in place; then on a vacation trip to Santa Fe he notified Fred Wendorf at the Museum of New Mexico. It was October before Wendorf, Alex D. Krieger of the University of Texas, and several of their colleagues could effect a meeting at the site with Glasscock. Notes were then made on the site, the rest of the skull removed, and application made to the Wenner-Gren Foundation for a grant to excavate. Many problems regarding the alluvial and aeolian stratigraphy had to be solved, and it was decided not to make any public announcement until fluorine tests determined whether the skull was as ancient as horse, camel, and other bones in the same deposit. The Wenner-Gren Foundation immediately made a generous grant but it was February, 1954, before the excavation took place with Wendorf in charge and Krieger collaborating. C. C. Albritton, Jr., of Southern Methodist University took charge of geological study; T. Dale Stewart, U.S. National Museum, restored the skull; and F. J. McClure conducted the fluorine and other chemical tests. In mid-June the tests were available, showing the human remains to be contemporaneous with the Pleistocene fauna, all of which showed a very high fluorine content in comparison with modern fauna. Wendorf and Krieger spent a week in Santa Fe preparing a report which was concluded in the fall. Its early appearance is anticipated. Artifacts of the Folsom culture were obtained in nearby blowouts, all invariably appearing on the surface of a thick mantle of reddish sand. This sand once covered the lacustrine deposits bearing the human and other Pleistocene fossils, hence the skull is older than Folsom by at least the time represented by the migration of the reddish sand over the site. Wisconsin glacial chronology does not, however, provide for any climatic stage which could account for this sand migration, which makes it difficult to estimate the age of the skull.

The Assistant Editor for Early Man would greatly appreciate it if archaeologists would send in news for this section voluntarily; coverage has not been satisfactory recently.

ARCTIC

Richard S. MacNeish surveyed the area between Tuktuk, just east of the MacKenzie, and the Canadian Alaskan border along the Arctic coast, concentrating on river valleys leading to the coast. A total of some 1000 artifacts and 29 new sites were found. Twenty-four were Thule sites, mainly prehistoric, while 2 other Thule sites have considerable depth and may be stratified. One site on the coast at the Yukon-Northwest Territories border appears to be Birnirk. A major site

was located about 20 miles up the Firth River, called Engitsciak (New Mountain) by the Eskimos. It is about 1200 feet long, 600 feet wide, and varies in depth of cultural material from 1 to 6 inches, running from 6 to 24 inches below the surface. The artifacts in this stratum look like those from Cape Denbigh. In a sampling of the site MacNeish found 3 microburins, 2 chipped semilunar side-blades, 3 triangular end scrapers, one graver made from crystal, 14 lamellar flakes, 2 with retouching, 10 thin-flaked side scrapers, a bone scraper handle, and fragments of large blades. At the same site, and evidently above this earlier occupation, were pieces of ground slate, a socket for an axe head (all of which appear to be Thule), and 2 well-fired pieces of pottery which appear Eskimo but not Thule. Plans are being made to excavate this site the summer of 1955.

William Irving tested several sites around a large lake some 40 miles east of Howard Pass in the Brooks Range. He reports evidence of fairly intensive occupation throughout long periods of time and suggests that the evidence indicates this may have been a center of population during several periods. The material ranges from European goods and late prehistoric to complexes in which prismatic flakes, diagonal flaking, small side blades, and burins are characteristic. The stratigraphy is complex, but several intermediate stages of development can be distinguished, most of which have some relation to the group of industries represented by the Denbigh Flint complex. Burins which have been ground on 2 faces but are otherwise similar to those of the Denbigh Flint complex from Anaktuvak are numerous in one part of this intermediate collection. Most of this early material is associated with houses. One of the earliest of them appears to have had a short but deep entrance passage and a sunken central fireplace. Rectangular houses with benches on 2 or 3 sides and short entrances with storm sheds, some 20-30 cm. below floor level, are quite prominent among the later dwelling remains. These have stone fireplaces set either in the center or, in one case, on a bench off to one side. In summary view it appears that this country was rich in food resources and probably was one of the main routes of travel between the Noatak and the Colville.

PACIFIC COAST

Archaeological field work at the University of Utah was limited this summer to the activities of the Statewide Archeological Survey of the Department of Anthropology. A survey of northeastern Utah was carried out by James H. Gunnerson who replaced Jack R Rudy as Field Director of the Survey. Two months were spent in the Uintah Basin-Tavaputs Plateau area and a 2-week reconnaissance was carried out in the area immediately west of the San Raphael Swell. One hundred thirty new sites were recorded including village and campsites, rock shelters, pictographs and at least one site which may prove to have considerable antiquity. For the most part the sites appear to be related to the Fremont culture.

Jesse D. Jennings, instead of conducting an archaeological field school as he has done in past summers, devoted most of the summer to the appraisal of the archaeological resources of the Missouri River Basin for the National Park Service. He spent 3 weeks examining the collections, manuscripts, research facilities, and available publication outlets of institutions which have been active in archaeological work in the Missouri River Basin. Jennings also organized and attended the Great Basin Archeological Conference held August 30-31 at Globe, Arizona.

Excavation of sites on Santa Catalina Island continued with a 3-week field camp at Little Harbor. Sites of 2 periods were investigated and additional material was secured on the famous steatite quarries of the island.

During June, William J. Wallace and Edith S. Taylor of the University of Southern California carried on excavations at a large site in Vermilion Valley, Fresno County. The site yielded evidence of 2 distinct tool assemblages. The first is that of the modern Indians, characterized by small projectile points, mostly side-notched with concave bases. The second assemblage is that of a dart-using people and contains several forms of large projectile points.

In August, Wallace, Edith Taylor, and H. Robert Hammond surveyed Butte Valley in the southern Panamint Range, recording 26 sites. The majority of the sites contained artifacts left by recent Shoshonean Indians, but 2 contained large projectile points similar to those recovered from the shores of Pleistocene Lake Manly in Death Valley. This work was a continuation of an archaeological survey of Death Valley National Monument under a contract with the National Park Service. A contract has been negotiated for a third year of work in the Monument.

Wallace also reports that H. Robert Hammond and Jack C. Collins conducted a brief survey in the Piru Creek valley, Ventura County. A dam, now under construction, will lead to the flooding of the region. Several sites were recorded and information was gathered concerning several more. More work will be done in this area in the fall.

Phil C. Orr of the Santa Barbara Museum of Natural History reports that Ralph Colcord has completed the cataloging of the Channel Island material which was collected during the museum's extensive excavations at a number of island sites. Orr spent a week on Santa Rosa Island repairing the permanent camp and rechecking the stratigraphy of several sites which he feels are probably of Wisconsin age.

The third Nevada State Museum-Western Speleological Institute Lake Lahontan expedition, consisting of Orr, J. W. Calhoun, and Art Lange, excavated Fishbone, Guano, and Cowbone caves on Lake Winnemucca. Split and burned bones of horse and camel were found in levels 4 and 3 of Fishbone cave, but were absent in the other caves. The chipped flint implements from the caves have been turned over to Ruth D. Simpson who reports several Pinto type points among them. A survey

of eastern Nevada caves was made in anticipation of continued work next year.

A number of field projects were conducted during the summer by crews representing the Department of Anthropology, University of California. Robert F. Heizer conducted the annual field training class in archaeology, in the Yuba River area, at site Nev-15 in the historic Maidu territory. This excavation and survey of 30 sites in the surrounding foothills suggest foothill and high mountain affiliation rather than relationship to the Central Valley groups.

J. A. Bennyhoff continued salvage operations at a site in the historic Yokuts area in the Northern San Joaquin delta. Underlying historic and protohistoric levels were artifacts representing the so-called Middle Horizon of Central California.

Adan E. Treganza, supported by funds from the State of California's Division of Beaches and Parks, continued excavations begun in 1953 at the Mission San Francisco de Solano (Sonoma Mission). He discovered the foundations of several mission buildings, the presence of which seems heretofore to have been unrecorded.

A group of students under the direction of R. J. Squier and G. L. Grosscup dug in 2 open sites in Lower Klamath Lake basin, California, during August, on lands under the jurisdiction of the U.S. Fish and Wildlife Service. Flexed burials were recovered from both sites. Twenty-two new sites were recorded, bringing to 344 the number of sites on record in the Tule Lake-Lower Klamath Lake region.

A. B. Elsasser continued a survey of sites in the historic Maidu-Washo areas, where a pattern of a widespread, perhaps homogeneous pre-Maidu, pre-Washo culture appears to be emerging.

The National Park Service continued support of the archaeological survey of Yosemite National Park. G. L. Grosscup, with E. Prince and R. Anderson, made test excavations at a site (Mrp-9) near the former Chowchilla Ranger Station, and surveyed 35 new sites in the area.

L. S. Cressman reports that a University of Oregon crew under his direction devoted a 10-week period to continued excavations at the Five Mile Locks site (WS-4) on the Columbia River, under a contract with the National Park Service. In the construction of U.S. highway 30, which formerly ran over this site, 7 feet of cultural deposit was removed. From the old road surface to the bottom of the fill where bedrock was exposed, the excavations were carried through approximately 23 feet of continuous occupation deposit. Four clearly defined geological strata were observed in the deposit, but the cultural stratigraphy is only approximately identifiable with the geological. The upper stratum has the diversity of finely worked projectile points so characteristic of the later Columbia River workmanship from this area. Stratum II shows a change, with the fine, diversified points replaced by probably a single type, and there is less variety in the artifact range. From the lowest cultural stratum, below a layer of hardpan, came percussion-flaked knives and projectile points. The projectile points are leaf-shaped with a shortened, constricted base. Girdled bola stones were found in the lowest part of this subhardpan level. These were associated with a considerable number of bones of large birds. Preliminary investigation of faunal and geological evidence suggests a terminal Pleistocene date for the earliest occupation of the site.

Two crews from the University of Washington worked in the Columbia Basin during the summer. Warren Caldwell, in charge of excavations at Wakemap Mound and Spearfish Valley, postulates early seasonal settlement of the area by hunters of large game followed by permanent use of the area by people who used fish in large quantities. These sites, located in The Dalles Reservoir area, are being excavated under a contract with the National Park Service.

A crew under the field direction of Earl Swanson continued excavations in the middle Columbian area above Vantage Ferry. A number of caves and midden sites were tested.

During the summer, Richard D. Daugherty of The State College of Washington, with 2 field assistants, conducted a survey of the upper Peace River area of British Columbia, covering the portion of the river from the Alcan Highway bridge to the confluence of the Finley and Parsnip rivers at the headwaters of the Peace. The principal purpose of the survey was to locate early occupation sites consistent with theories suggesting the Peace River as perhaps one of the principal early migration routes between the Interior Plateaus of Canada and the northern Plains. Seven weeks were spent in the area, and although a number of recent sites were found, no evidence of paleo-Indian sites was discovered.

After concluding the Peace River Survey, Daugherty conducted surveys of 2 proposed reservoir areas in eastern Washington in cooperation with the National Park Service; 19 sites were located in the reservoir area of the Rocky Beach project on the Columbia River. Three of these are important sites and should be excavated. The survey of the small Pend Oreille River reservoir area contributed no new site locations.

Charles Borden, assisted by a grant from the University of British Columbia Committee on Research, carried out surveys in widely separated areas of British Columbia to determine the archaeological resources and research requirements in various areas, and to assess the urgency for salvage operations. In June and early July, he concentrated his efforts in selected areas in central British Columbia and west to Prince Rupert. At Cache Creek a burial site was tested. During a stopover at Williams Lake, part of the lake shore was surveyed and 19 circular house pits located. At Prince Rupert, Jim Baldwin, an alert high school student with a strong archaeological interest, reported to Borden's party the location of 35 sites in the vicinity. These sites were visited and a test excavation was made at one of them. Ten days were spent testing the important interior Tsimshian site of Gitsumkalum on the west bank of the Kalum River. Evidence was found indicating long

occupation of the site and significant cultural change. On the return trip from the Skeena country, Borden's party spent several days making a site survey along the shores of Fraser Lake. Twelve sites were located, and evidence was found of talus burials in this area. It is Borden's belief that these burials, the artifacts associated with them, and other evidence, indicate a pre-Carrier occupation of the area.

In mid-July Borden returned to Vancouver to make test excavations at the Marpole site for the purpose of collecting charcoal for radiocarbon dating. Borden has recently received radiocarbon dates from 2 other important British Columbia sites. These dates resulted from tests run by Dr. K. J. McCallum who is in charge of radiocarbon dating at the University of Saskatchewan. For the early horizon at the Locarno Beach site in Vancouver, a date of 2430±163 years was received. The date for the Natalkuz Lake culture in central British Columbia is 2415±160 years.

Borden and his crew spent the remainder of July and August surveying in the Kootenay district in southeastern British Columbia. Their surveys included the Canadian portion of the reservoir to be formed behind the Libby Dam in Montana, Columbia and Windermere Lakes, and portions of the Columbia River which would be included in the reservoir of the proposed Mica Creek Dam. Borden concluded his summer's work with a survey of the east and west shores of Howe Sound.

Information received from the National Park Service, Region Four office, indicates a number of projects are going forward under their support, in addition to those mentioned above. In Monticello Reservoir, California, a Bureau of Reclamation project, the University of California, under contract with the National Park Service, has started excavations under the direction of A. E. Treganza. This area will be flooded in 1957 with little hope of any reasonable sampling of more than 2 or 3 of the 50 or more sites. Arrangements have been made by archaeologist Louis R. Caywood whereby water control projects on Chino and San Antonio creeks in southern California, proposed by the Los Angeles District Corps of Engineers, will be checked by members of the Archaeological Survey Association of Southern California under the direct supervision of the staff of the Southwest Museum. Louis Caywood made test excavations and excavated a burial in Yosemite National Park in an area where proposed construction threatened an archaeological site. A short report on this work appeared in the May, 1954, issue of *Yosemite Nature Notes*.

THE GREAT BASIN ARCHAEOLOGICAL CONFERENCE

EDITOR'S NOTE: The following report was specially prepared by Clement W. Meighan, University of California, Los Angeles, at the request of the Assistant Editor for the Pacific Coast. The conference is reported at some length because it marks the appearance of a new and potentially very important organization. Such organizations have already shown, in the Plains, Southeast, and Southwest, particularly, that rapid progress in solving archaeological problems can be made by regional groups.

The first meeting of the newly organized Great Basin Archaeological Conference was held August 29 and 30, 1954, at Gila Pueblo, Globe, Arizona, in conjunction with the Pecos Conference. The organizational session was attended by 24 archaeologists from western institutions interested in Great Basin research, and from 20 to 50 individuals attended the informal sessions. The conferees devoted their final session to drawing up a tentative chronological chart for Great Basin cultures; this outline presentation is being circulated for criticism and revision at the next conference. The next meeting was set for August, 1955, at the Southwest Museum, Los Angeles with Ruth D. Simpson of that institution as chairman.

A much-condensed summary of the views expressed at the meeting is given below, in order of presentation at the conference.

The conference was opened by J. D. Jennings, who was elected chairman by acclamation. Following a discussion of organization and program of the conference, Jennings extended a special welcome to the nonprofessional archaeologists who were present in some number and who contributed substantially to the success of the meeting. Lack of contact between Basin archaeologists was noted as the primary need for such a conference. The great expansion of archaeological work in the Basin in recent years points up the importance of prehistoric Basin cultures and calls for some ordering of the data hitherto gathered.

The Great Basin appears to be important culturally as a root stock for much of the later developments in the so-called higher cultures of the Southwest and Plains. A broad cultural base, the "Desert" base or culture, probably constitutes the hypothetical Basketmaker I period and is thus the beginning of the later Pueblo cultures. In addition, the Middle Lithic (or Archaic) of the Plains shows strong Basin relationships. It appears that the big-game hunters were secondary and peripheral to most of the Basin.

C. W. Meighan (University of California, Los Angeles): The California coastal region presents a diversity of archaeological cultures, some of which appear to throw light on Basin-Coast relationships. In northern California, the Great Basin is sharply marked off by the Sierra Nevada and little cultural influence seems to have crossed this impressive geographic barrier. In southern California, the desert regions represent an extension of the Great Basin extending almost to the coast, and it is in this region that the most clear-cut Basin-Coast relationships should be found.

An archaeological problem arises from the great differences apparent in sites of the littoral zone (on and immediately adjacent to the coast), and those a few miles inland. In southern California sites of the 2 zones present a quite different appearance and make correlation with other areas a difficult task.

There can be little doubt that actual trade relationships existed between southern California and the Great

Basin, for marine shells from the California coast occur in Basin sites. However, this trade appears to have been quite limited in late times. Of 23 distinct types of shell beads occurring at the Arroyo Sequit site (4-LAn-52, on the coast above Los Angeles), only 2 or 3 have been found in the Basin.

Phil C. Orr (Santa Barbara Museum of Natural History; Nevada State Museum): An outline of the culture sequence devised by D. B. Rogers was given, the periods including Oak Grove, Hunting People, and Canaliño. Canaliño includes the historic Chumash groups and extends back into prehistory possibly 4 to 5 thousand years. Oak Grove, at the other end of the scale, is a metate-mano and crude chipped stone culture. One Oak Grove location at Tecolote is definitely Wisconsin in age. The islands have Canaliño, Highlander, and Dune Dweller cultures, corresponding to dry, wet, and dry climates. Beneath the Dune Dweller is a wet climate series of campsites 8 feet below waterlaid sediments of probable Wisconsin age, and a cave culture of uncertain age although definitely pre-Highlander. There is only one radiocarbon date for the cultures mentioned; a date of 1860 years for Late Canaliño.

George F. Carter (Johns Hopkins University): Evidence for an interglacial age for man at San Diego rests on several lines of evidence: (1) that the region is geologically stable; (2) that the sea level fluctuations are due to withdrawal from and release to the ocean basins of water during the glacial and interglacial periods; (3) that landforms can be related to these sea level changes; and (4) that a cross check via soil science exists in that the materials in landforms of lowered sea level periods reflect more humid conditions than do the materials of high sea level periods, as they must do if they are related to glacial-interglacially caused sea level changes. One radiocarbon date tends to substantiate the Wisconsin age of the alluvium at La Jolla reported in 1950 as containing a mano. Radiocarbon data on shell middens 2500 and 4000 years old indicate very slow rates of soil development under arid conditions. The evidence for interglacial man now consists of hearths with shell and burned bone and percussively broken cobbles to supply flake and core tools. This material is of significance to the Great Basin in two ways. First, it suggests that the material in the Great Basin will prove to be of comparable age. Second, the method of analysis of landforms in relation to water levels and climate is directly applicable to the pluvial lake areas. In later times it is clear that influences from the Great Basin reached the coast probably via the Colorado basin. This is reflected in trade materials and pottery in later times and in lithic industries at least as early as Roger's Playa.

Merrill Peterson (Logan, Utah): A summary report was given on the archaeology of Cook's Cave, Promontory Range, Utah. The site is a cave 50 feet deep, about 18 feet wide, with from 5 to 8 feet of deposit. It is located in habitat similar to that of Danger Cave. The site shows evidence of uninterrupted occupation from historic times back to the sand level left by Lake Bonneville. Although stratigraphy was destroyed near the margins of the site, 3 cultural levels have been recognized: Recent — the top 12 inches or so of the deposit, characterized by small obsidian arrowpoints and other artifacts corresponding closely to Steward's Late Promontory culture; coarse sherds of Promontory ware found; manos and cooking stones (fire-broken) numerous; perishable materials virtually absent, having been destroyed by moisture. Middle — a definitely demarcated period, with larger points and blades; some pottery in upper portions; manos and cooking stones disappear at the bottom of this level; some of the points of Pinto type. Bottom — very large blades or knives, most often of material other than obsidian; side-notched tools predominate.

No fluted points or other Eastern influences were noted, the site showing similarity to such western complexes as that of Borax Lake and Silver Lake. Levels are dated by comparison to Danger Cave, since the site substantially duplicates that sequence.

L. S. Cressman (University of Oregon; paper read by R. D. Daugherty): The Great Basin, if we use the basic idea of an area with an interior drainage pattern, has changed markedly throughout the Neothermal. Definition of the area is thus made difficult in view of environmental changes through the time continuum. However, certain arbitrary decisions have to be made to get on with the problem. Classifications of cultures in a space-time continuum will reveal both expansion and restrictions on the areas involved. The northern Great Basin presently conceived to include the Lahontan hydrographic basin and those of the central Oregon pluvial lakes is considered to include the Klamath Lake basin for a long period of the human history of the latter. Realistically the borders of the Great Basin culture ought to be defined by those areas into which it spills over and is the dominant manifestation.

Since the human occupation of the Great Basin was so profoundly affected by the great climatic changes of the Neothermal it seems reasonable to incorporate the idea of the environmental changes in a classificatory system. The subdivisions of the Neothermal provide a satisfactory chronological frame of reference related to the environmental situation in its overall aspect and may be designated as "periods." Within each period there would be a series of "phases" representing the spatial aspects on a fairly large scale, roughly an ecological area. Within each "phase" would be a series of "facies," representing the local manifestation of culture; within each "facies" would be a series of "components." As an example of the proposed plan the following is suggested:

I. Culture: Great Basin
  A. Period: Anathermal
    1. Phase: Bonneville
      a. Facies: _____
        1)_____, 2)_____, etc.

2. Phase: Northern
   a. Facies: Klamath Lakes
      1) Component:_____
         a) The Narrows (L. Klamath Lake)
         b) Kawumkan Springs, early
         c) _____, etc.

3. _____, etc.

B. Period: Altithermal
1. _____, 2. _____, etc.

C. Period: Medithermal
1. _____, 2. _____, etc.

Richard D. Daugherty (State College of Washington): An overview of the Plateau area is restricted due to unequal geographic coverage, nearly all work to date having been done on the Columbia River. Also, it is necessary to take into consideration the prehistory of the Northwest Coast to fully understand Plateau prehistory, and, unfortunately, the former is very little known.

The earliest material yet known from the Plateau comes from the Lind Coulee site in central Washington. Specimens include well-made stemmed projectile points, large keeled scrapers, snubnosed scrapers, crescentic blades, a serrated bone point, beveled bone shafts, and a grinding palette for pigment. Materials from what is probably a slightly more recent period have been found by Earl Swanson in the Middle Columbia area above Vantage Ferry. Joel Shiner has excavated a site near Hat Rock believed to be 1500 to 2000 years old. Cressman's Five Mile Lock site may go back to the Lind Coulee period. Most of the known material is late in time. There is a succession of house types, with the earliest known form being the semisubterranean pit house. These were succeeded in late prehistoric times by the mat lodge and tipi. In restricted areas the semisubterranean house has lasted into quite recent years. The burial situation is very complex, with cremation pits, shed house burials, cairn burials (extended and flexed), rock talus burials, and other forms known from the region. To summarize, the earliest material fits into a general large cultural substratum which would include the early Great Basin cultures. Later periods have developed somewhat unique and locally differentiated cultures with special emphasis on fishing as an important means of subsistence.

Joel L. Shiner (University of Arizona): The River Basin surveys program in the Plateau operated between 1947 and 1952. In the McNary region, where most of the excavation was conducted, a culture sequence was recovered which extended from prehistoric times into the 19th century. The earliest Indians hunted and took a few salmon although they had no specialized fishing economy. Their only skillfully made tools were leaf-shaped projectile points. Later, members of the same culture learned to use fishing nets and began to develop the specialized fishing-hunting-gathering economy. Projectile points changed to a large side-notched type and finally to small side- and corner-notched types. Houses were semisubterranean with mat covered superstructures. After 1800, the surface mat lodge also came into use. Many new artifacts were added during the late prehistoric period. These included stone mallets, jadite adze blades, shaft smoothers, and other objects of carved stone and bone. From a hunting and gathering economy, which is estimated to have existed about 2000 years ago, the development was gradual until the typical Plateau economy was reached, some time prior to the white penetration of the region. Deterioration of native culture was rapid after 1830.

Dick Shutler, Jr. (Collaborator, National Park Service): The current Lake Mead project is a study of the archaeological materials excavated by the Heye Foundation in cooperation with the State of Nevada in the 1920's and by the National Park Service in the 1930's. The ultimate aim is the publication of a definitive report on the Puebloid cultures of Southeastern Nevada. The study is now going on and is expected to take 3 years. In addition to analysis of the older collections, some field work is planned, in particular, a survey of southeastern Nevada to determine the regional extent of the Lost City type of culture. It is also hoped that stratigraphic data may be derived from test-pitting various locations. Institutions with Lost City material that are cooperating in the study include the Nevada State Historical Society, Nevada State Museum, Southwest Museum, and National Park Service. The older collections are of particular importance in this study, since most of the area concerned was inundated by the waters of Lake Mead.

Ruth D. Simpson (Southwest Museum): The concept of widely-diffused lithic industries has replaced the belief that virtually every new site represents a separate culture.

One of the oldest and most widespread indigenous dart-point complexes of the Great Basin is the Pinto Basin assemblage. Specimens from type sites in Pinto Basin, California occur as much as a mile from the present river channel. Pinto sites are associated with ancient river and lake terraces throughout a wide area, from Wyoming to Baja California, from California to Nebraska. The Pinto Basin complex includes a variety of implements: characteristic Pinto dart points, grinding tools, gravers, blades, abundant scrapers, intrusive points, etc.

The Lake Mohave complex, also widely diffused in the desert area, has yielded similar specimens except for distinctive projectile points. Lake Mohave and Pinto Basin complexes share many sites and are considered contemporary, at least in part.

Recent excavations at the Stahl site, near Little Lake, California, have shown the abundance of Pinto tool types and have exposed several house floors. Not only is the Pinto complex widespread and specialized, it appears to have persisted over a very long time period. Apparently there are at least 2 Pinto horizons. One of these is 2000 or 3000 years old, the other much older.

W. J. Wallace (University of Southern California; paper read by C. W. Meighan): For the past 3 years the Department of Anthropology at the University of Southern California has been conducting an archaeological survey in Death Valley National Monument, under contract with the National Park Service. The major work has been concentrated in Mesquite Flat, the northern arm of Death Valley. Anciently, the region formed part of Pleistocene Lake Manly. Sites are surprisingly abundant, although none has any depth, the artifacts having been left on the ground by the blowing away of the soil. The surface collections indicate several occupations including both nonpottery and pottery sites. Most numerous are the characteristic "mesquite camps"; over 250 are located in or near craterlike depressions between sand dunes which have piled up around mesquite trees. All appear to represent temporary settlements. Artifacts include small points with side and basal notches, blades, drills, manos, metates, and brown sand-tempered pottery. The material is quite similar to that made by recent Shoshonean Indians.

Two complexes which appear to be older were found on eroded clay surfaces at sites on the 40 foot terrace of Lake Manly and on a stretch of bare clay at a lower elevation. These complexes cannot be placed in time, although both are surely older than the "mesquite camp" assemblage. They do not show much resemblance to previously described desert cultures of this region.

B. E. McCown (Archaeological Survey Ass'n. of Southern California): Recent work of the ASA in the Blake Sea (Imperial Valley) region indicates that the Blake Sea filled several times, and was utilized by primitive man for fish and other resources. The latest filling is shown archaeologically by sites which have been uncovered in sandy locations by the prevailing northwest winds. Cremations and other material have been recovered. Also known is a house site in an isolated location with fireplace, charcoal, fishbones, pottery, and chipped material. In a dune 12 feet high is located another and earlier culture representing occupation of the area during the filling of the Blake Sea prior to the most recent filling. The site, which has yielded fishbones, stone flakes, points, and charcoal, has similarity to Rogers' Playa culture.

Stuart Peck (Archaeological Survey Ass'n. of Southern California): Recent investigations at the Lake Mohave site have been aimed at resolving the controversy which results from the location of the site on a beach bar extending across the outlet channel of the lake. Rogers and others have stated that the site could not have an antiquity extending back into the period when the lake was full because the site would have been under water. However, it appears on closer examination that there is a small but definite channel cutting into the surface of the site and Rogers' objection no longer appears tenable. The age of the site is believed to be several thousand years.

In a joint Great Basin-Pecos Conference session a symposium on early man was presented:

E. B. Sayles (Arizona State Museum), with collaboration of *Ernst Antevs*: Since the Cochise culture was defined in southeastern Arizona in 1941 considerable work has been done relating to it. The most important is the excavation of Ventana Cave by Haury. The Arizona State Museum survey has also gathered more data, and the work of others outside of Arizona has contributed much information. All of this associates with the Cochise culture a mass of sites and material far in excess of that associated with any other comparable archaeological complex known in America. In order to bring the Cochise culture up to date, Sayles and Antevs have been carrying on, for the past 3 years, a review of the work first done by them and of the new data obtained by them and others. The complete study is not yet finished but it can now be said: the original sequence of stages and their geological associations have been confirmed; radiocarbon dates have essentially supported the original geological dating; new data have confirmed the long duration of the different stages, which can be defined more minutely.

The Cochise culture still represents a basically gathering economy, but one in which hunting is now found to be more important in some stages than was first recognized. Projectile points have now been identified, as a result of further excavation at the Double Adobe site, with the Sulphur Springs stage, the oldest of the Cochise culture. These are leaf-shaped types fashioned from flakes, as well as stemmed and barbed types. The exact relationship of the Cochise culture to other cultures is yet to be determined, but the present study is expected to add much pertinent information.

Ruth Simpson (Southwest Museum): The time period included under the general heading of "Early Man" is taken to include that time from about 2000 B.C. to deep in the Pleistocene epoch. Projectile points appeared late in Wisconsin times; therefore we may define 2 periods of early human occupation: 1. the earlier period, lacking stone projectile points; 2. the later period characterized by stone projectile points.

Present discussion is concerned only with the early period. It is believed that there was a widespread, simple, cohesive lithic industry west of the Rockies, extending from Wyoming to Baja California, with these traits: primarily choppers, scrapers and similar tools; invariable use of local material; percussion flaking; predominantly cores; no grinding tools or stone projectile points; tools heavily weathered and patinated. Tools were purposefully created, not rejects or accidental occurrences.

There are few purely nonprojectile point sites; they are usually mixed with later material. Sites are believed to be old camps rather than quarries or workshops. Obsidian tools are lacking; the early industry may have predated late Pleistocene obsidian outflows in many areas.

The case for long Pleistocene human occupation of the New World is growing ever stronger. Man's New World age-potential becomes apparent as arbitrarily established age-ceilings are discarded, thus clearing the way for unbiased research.

Richard D. Daugherty (State College of Washington): Slides of the Lind Coulee excavation were presented with a discussion of the geological features of the site and some of the problems in dating the culture.

Ernst Antevs (Globe, Arizona): Geological charts of the Albuquerque and Clovis sites in New Mexico were discussed. The Albuquerque column has at its base over 10 feet of cobbly gravel brought by the Rio Grande when it was a much more powerful stream than now. Above this are 10 feet of silts in which Frank Hibben has found artifacts and hearths left by hunters of Pleistocene mammoth, horse, camel, and bison. These date from a time when the Rio Grande had moved and lowered its bed so that it occasionally flooded the camps. The silts are overlaid by 8 feet of medium gravel. All these beds must be associated with the deglaciation of the San Juan Mountains. The cobbly gravel must derive from an age of rapid melting of large glaciers, that is, from a warm age early in the deglaciation. The medium gravel marks another warm age. The silts with the sites record an age of relatively slow melting, a cold age. They may be correlated with the Sioux Lookout-Pembroke age of readvance of the last ice sheets just north of the Great Lakes about 14,000 years ago.

At the Clovis site Glen Evans found evidence of an ancient spring-fed pond some 700 feet in diameter, with several depositional layers visible. Since the lowest bed indicates strong stream flow, the oncoming of the pluvial is not recorded, but the stream must have been dammed just below the basin by either beavers or man. Erosions separating the 4 pluvial beds must have been caused by either wind or water. Since wind erosion would have required drier climate than now prevails, and since other evidence of such dry intervals in the pluvial is lacking, the erosions may have been caused by the stream after failure of the dam, which was rebuilt 3 times. If bed 3 with Folsom points is about 10,000 years old, bed 1 with Clovis Fluted points may be 12-13,000 years old.

George Carter (Johns Hopkins University): A detailed discussion of geological features pertaining to early man in the San Diego area was given. Outstanding points are summarized in the previously quoted comments of Carter.

Fred Wendorf (Museum of New Mexico): Geological features of the Midland locality were outlined in some detail. Folsom points have been found on top of the red sand zone (Judkins formation). Some later type material also occurs in this horizon and probably dates from the higher tan sand (Monahans) which has been almost destroyed by erosion. A human skull and fragments of other human bones have been recovered from still deeper levels, a gray sand which contained bones of several Pleistocene mammal species. Chemical tests indicate that the human and animal bones are of about the same age.

The Concho complex now has metates and manos (rare), not previously reported. The fluted points of the complex are now believed to be Clovis Fluted rather than Folsom Fluted points. It was first felt that the sands under the Concho complex dated from about 4000 years ago, but since Clovis and parallel flaked points have been found above this level, the original dates for this formation are considered incorrect and the complex could be much older.

SOUTHWEST

The University of California at Los Angeles conducted its summer field school in southern Utah, concentrating on the site of Paragonah excavated by Judd some 40 years ago. A field crew of 16 excavated 2 small mounds, uncovering 4 adobe-walled surface structures and 2 pit houses. A definite stratification in pottery types was recorded.

The Southwestern National Monuments of the National Park Service reports that Park Service Archaeologist Lloyd Pierson has excavated a pit house site in the Verde Valley near Camp Verde, and that archaeological surveys have been conducted at Bandelier National Monument and in Gila County, Arizona, in the area surrounding the town of Globe. A branch preservation laboratory has been established at Gila Pueblo to provide centralized and adequate storage facilities for archaeological and historical materials from field areas of the National Park Service in the Southwest.

The annual meeting of the Pecos Conference was held at the Southwestern National Monuments Headquarters in Globe on August 30, 31 and September 1, with over 125 registered. Charles DiPeso was Program Chairman and Dale King was in charge of local arrangements.

E. W. Haury was chairman of the Archaeological Field Report session, traditionally the opening session of the Pecos Conferences. Twenty-five reports were given, including results from salvage archaeological programs, and the summer field schools of the Universities of Colorado, New Mexico, and Arizona, and Trinidad Junior College. The second session was devoted to ethnological studies under the chairmanship of Florence Hawley Ellis. These centered around the Indian Land Claims studies now under way. At succeeding sessions, symposia included one on the Federal Government's future role in the field of anthropology with Erik Reed as chairman, followed by one on late Mexican-Southwestern connections chaired by Paul Ezell. DiPeso showed a number of slides of the excavation of the Palo Parado site in southern Arizona, probably the village first visited by the Jesuit missionary, Father Kino, founder of the Arizona Spanish missions. This was followed by a session on dating methods, chaired by

T. L. Smiley of the Tree-Ring Laboratory at the University of Arizona. Discussants included Smiley on dendrochronology; John F. Lance of the University of Arizona on paleontology; Raymond H. Thompson, University of Kentucky, on valley fill tests at Point of Pines, Arizona; Ernst Antevs on geological dating; E. N. Wise of the University of Arizona's radiocarbon laboratory on radiocarbon methodology; Roger Anderson, University of Arizona, on palynology (pollen analysis); E. B. Sayles, Arizona State Museum, on early man; John Rinaldo on cave archaeology and cave dating; Emil Haury on dating in the western Pueblo area; and Robert Lister, northern Mexico dating. The final session was devoted to contact period archaeology (or ethnohistory) in the Southwest with J. O. Brew as moderator. The Conference accepted an invitation to hold the 1955 meetings at Santa Fe as guests of the Museum of New Mexico. Joe Ben Wheat, Charlie R. Steen, and Stanley Stubbs were appointed to the Interim Committee.

NORTHERN MISSISSIPPI VALLEY

Iowa. Reynold J. Ruppé had a group of students on an 8-week dig last summer working on sites close to Iowa City. The sites included 9 burial mounds which probably date from Middle Woodland times (no pottery was found), a Middle to Late Woodland campsite showing affiliations with Keyes' Amana culture, and an Early Woodland site where several sherds of pottery similar to Marion Thick were found. The last site is apparently a Late Archaic to Early Woodland period village, but it has unfortunately been largely destroyed by plowing. This fall Ruppé and several students will start work on the Keyes collection and on one other well-documented collection.

In the course of examining private collections in the state, Ruppé has found several fluted points not previously reported. These have exact provenience data and it looks as if many more will be found in Iowa.

Illinois. The University of Illinois Department of Sociology and Anthropology conducted a survey of the Illinois River and its immediate drainage under the supervision of John C. McGregor. According to McGregor enough new items were added to give the best survey of the region yet available.

The Archaeological Survey of the Cache River Valley in southern Illinois was conducted by Irvin Peithman during the summer of 1954. This work is part of a long-term research project, Cultural Dynamics in Southern Illinois and Northern Mexico, conducted by the Museum of Southern Illinois University.

The Illinois State Museum archaeological field party was out for 10 weeks last summer, excavating in Hardin County. A village of the Archaic period was test pitted, and yielded projectile points, bannerstone fragments, hammerstones, and a large number of mealing or grinding stones. The material resembles that from the upper portion of the rock shelter in Randolph County excavated in 1952 and 1953. A burial mound of Hopewellian affiliation was also excavated. Copper ear spools, shell beads, a pottery platform pipe, and a tetrapodal vessel were found with the 23 burials. A group of 10 students and 6 local laborers carried out the work under the direction of Melvin L. Fowler.

Indiana. The Indiana Historical Society once more sponsored the annual Archaeological Field School at Angel Mounds under the direction of Glenn L. Black, in conjunction with the Indiana Department of Conservation and the University of Indiana. Explorations were limited to a continuation of the 1952 excavations.

James H. Kellar has completed the manuscript covering the fruitful 2-year survey of Spencer County, and is now engaged in the preparation of his report on Perry County and the C. L. Lewis Stone Mound.

Carol K. Rachlin, of Columbia University, began an intensive study of textile impressed sherds from the Angel site. The unbelievably large number of sherds available will be productive of valuable data on Middle Mississippi textiles and their uses.

Ohio. During the spring of 1954 the Department of Archaeology of the Ohio State Museum completed excavation of the Toepfner Mound, located on the west side of Columbus. Some interesting artifacts came from the mound fill and from the 85 burials found.

During the summer work was resumed at the Fort Hill State Memorial, under the direction of R. S. Baby. Excavation of a small area in the valley south of the enclosure revealed a posthole pattern of a large, subrectangular, round-cornered structure 120 by 60 feet. From its postholes and interior came considerable lithic material, pottery, mica, and obsidian.

Wisconsin. Chandler Rowe, Department of Anthropology, Lawrence College, headed the 1954 Wisconsin Archaeological Survey expedition to Aztalan, a party which included Warren Wittry, Curator of Anthropology, Wisconsin State Historical Museum; Harold K. Schneider, Department of Anthropology, Lawrence College; Joan Freeman and Robert Deuo, graduate students, University of Wisconsin; and James Sackett, senior at Lawrence. The purpose of the Survey, which includes Lawrence College, Beloit College, University of Wisconsin, Milwaukee Public Museum, and Wisconsin Historical Society, was a continuation of the restoration of the village of Aztalan for the Wisconsin Conservation Department, Parks Division. During the summer the entrance to the stockade was located and the northwest pyramid restored.

New Regional Journal. Last April officers of the Illinois State Archaeological Society, the Greater St. Louis Archaeological Society, and the Indiana Relic Collectors Society agreed to pool part of their membership dues in order to support a joint publication, the *Central States Archaeological Journal*. It will be a quarterly, and is available to those not members of one of the cooperating societies at one dollar an issue. Vol. 1, No. 1 appeared in July, 1954, with several short articles, numerous illustrations, and a section of local and personal news. The editor-in-chief is Byron W. Knoblock, 2016 Jersey Street, Quincy, Illinois.

NORTHEAST

The University of Toronto conducted investigations in 3 areas of Ontario during the summer of 1954.

1. T. F. McIlwraith and Robert F. Popham examined curious stone depressions on raised beaches along Lake Superior's north shore.

2. Robert C. Dailey, assisted by James V. Wright and Walter Kenyon, conducted an archaeological survey on the north side of the St. Lawrence River between Cornwall and Cardinal. Several major sites and a number of small ones were recorded thereby adding to those already reported by the Leechman-DeLaguna survey of 1947. Several large collections were examined and photographed. One large site, the Malcolm site, near the planned location of the Barnhardt Island Power Development, was examined after the survey was completed. This site represents a rather large Point Peninsula occupation. A small amount of Iroquoian and contact material is sporadically mixed with it.

3. Petroglyphs in the Stony Lake area of Peterborough County were examined and recorded. These are located on crystalline limestone and cover an estimated area of 4000 square feet. Plaster casts of the more legible ones (over 70) were made and are now at the University of Toronto. Paul Sweetman and Lester Bissell worked on this in July. In August, Stuart Nease and Vincent Conroy continued the project. Paul Sweetman reports that he and Bissell also found a large Lalonde site about a mile from Stony Lake's east end. This is the first Lalonde site reported in that part of the province.

Thomas E. Lee, National Museum of Canada, continued the excavation of the Sheguiandah site on Manitoulin Island. The village area was trenched and confirmation of the existence of 5 or more superimposed components was obtained. Four hilltop swamps were also trenched. Artifacts were found in each of these in the clay which at times was beneath an overburden of 5 feet of peat. Probably the most important finds of the Sheguiandah excavations were the big blades with thin points and secondary chipping in glacial till. Beneath the till man-made chips were found in glaciofluvial material. Related studies of paleobotanists, geologists, mineralogists, and specialists in peat and soil analysis may provide more conclusive information on the antiquity of these finds.

Frank Ridley reports that he and his wife made a partial reconnaissance of Lake Abitibi, Ontario, as part of the planned examination of sites on the waterway between the Ottawa River and James Bay. Three sites were located and test dug, Fort Abitibi, the Abitibi Narrows, and Troyes Island. Since a strange chipped stone complex appeared at the Abitibi Narrows site, Ridley and James Wright returned to this site and put in a week of excavating. Ridley planned to excavate a deeply stratified site on the Montreal River in October.

A party from the New York State Science Service and State Museum spent 7 weeks in July and August on reconnaissance and excavation in the International Rapids section of the St. Lawrence River. This is the area of first dam operations in connection with the St. Lawrence Seaway and power projects. William A. Ritchie headed the party consisting of Robert R. Young and Walter Knowlson. Archaeological evidences proved, in general, to be scanty and sporadic. On Long Sault Island, they excavated a campsite seemingly occupied by sturgeon fishers at various intervals from Middle through Late Woodland times. The indications of this were a variety of sherd types and sturgeon plates, and the near absence of hunting points and refuse mammal bone.

A discovery of considerable significance was made by the party on Rockway Point, N.Y. in a small sand knoll high above the St. Lawrence. Here burials of 3 periods of occupation were exhumed. They ranged from Late Archaic to Late Woodland. Six were cremations, single or multiple, representing a minimum of 10 individuals, burned elsewhere. A highly distinctive form of Laurentian, flint, javelin point, exhibiting fire scars, embedded in one mass of calcined human bones, provided a clue to the cultural provenience of the cremations. Of special interest were indications in some cases of wind-scattering of fragments under partial dune conditions. As the sand was probably deposited by a postglacial marine invasion of the St. Lawrence Valley (Champlain or Ottawa Sea), and a 10-inch layer of unbroken humus covered the graves, for which no pit outlines could be distinguished, it would appear that the first hunting bands to bury here arrived prior to the stabilization of the soil by heavy forest cover. Charcoal for radiocarbon analysis was obtained from a hearth found at the same deep level. Elsewhere in the knoll, beneath some 7 inches of unbroken humus and several feet of sand, an extraordinary tomb, presumably of the Early Woodland period, was discovered. A complete covering of heavy boulders overlay an extensive deposit of red ocher enveloping the closely flexed and much decayed remnants of an adult skeleton. Inexplicably, the usual grave offerings of permanent character were lacking. Still another part of the knoll yielded, under a scanty humus cover, the poorly preserved bundle burial of an adult male. Among the bones was a large decorated rim sherd of the Late Woodland period.

The New York State party also spent 10 days in east-central New York excavating a large campsite of Early and Late Archaic times. Lamoka type points prevailed in the lowest level and only stone material had survived.

Father Thomas Grassmann reports that the Mohawk-Caughnawaga Museum, Fonda, New York, has continued excavating the Caughnawaga site. The outlines of 8 lodges and a partial or incomplete structure can now be seen. It is hoped that by the end of 1955, the entire interior of the village will have been excavated.

The Upper Ohio Valley Archeological Survey excavated a series of "stratacuts" at 7 sites, 3 of which were moderately productive of ceramic sequences. Charcoal samples for radiocarbon analysis from both Early and

Middle Woodland contexts were obtained. At the Leetsdale site (36A17), one stratacut revealed a feature containing the unusual Wellsburg Simple Stamped pottery. This extends the known range of the type.

Mayer-Oakes also reports the partial excavation of a small rock shelter in Preston County, West Virginia. A good series of Archaic material was obtained. In addition the UOVAS conducted survey work in the Cheat River area and in the Allegheny valley.

Irving Rouse reports that the New Haven Chapter of the Archeological Society of Connecticut continued to excavate this past summer at the Grannis Island site in New Haven Harbor, with Lyent W. Russell in charge. Additional North Beach and later material was found, including further confirmation that Vinette 1 pottery and steatite vessels are associated in the North Beach focus.

The Willimantic State Teachers College, under the leadership of Eva L. Butler, is completing its excavations at the Main site near Norwich. This, too, shows a sequence beginning with the North Beach focus and extending to protohistoric time.

MIDDLE AMERICA

A cooperative expedition of Southern Illinois University and the Instituto Nacional de Antropología e Historia, financed in part by a grant from the Wenner-Gren Foundation for Anthropological Research, excavated at the Schroeder site, near the city of Durango in northern Mexico during the summer of 1954. It was under the direction of J. Charles Kelley of S.I.U. and Ramon Pina Chan of the I.N.A.H., assisted by William J. Shackleford and Esther Bennett of the S.I.U. Museum staff and Howard Winters, graduate student at the University of Chicago. Two large masonry structures, perhaps residences of priests or nobles, complete with rooms, courts, house platforms, stairs, and banquettes, were largely excavated, together with one small circular structure. The principal pyramid of the site was cleared but not excavated. Burials occurred under house floors and in room fill. Artifacts were numerous, including objects of ground and chipped stone, metal, bone, shell, and pottery. The basic affiliations of the site are with the Chalchihuites culture, known elsewhere at Chalchihuites and La Quemada in the Zacatecas. Trade with the Aztatlán culture of the Pacific Coast was indicated during the latter part of the site's occupation. A sherd tentatively identified as a Teotihuacan II or III fresco sherd was found at the bottom of a stratigraphic test. The expedition worked under a contract with the Mexican government and had also made the necessary arrangements with the Durango state government. Nevertheless, after the specimens had been loaded for shipment to Nuevo Laredo to await the export permit they were confiscated by the Durango state government. Later they were released for shipment to Southern Illinois University for study and the preparation of a report.

HIGHLAND SOUTH AMERICA

PERU. Louis Stumer reports the following archaeological activities from July to September:

Clearing and partial excavation of the main structure at Vista Alegre, a Rimac Valley site, continued. The Tiahuanacoid tombs yielded considerable material of great variety and high artistic caliber.

The site of Santa Clara was reconnoitered by Stumer after he had completed his report on the major sites of the Rimac valley (AMERICAN ANTIQUITY, Vol. 20, No. 2). This site, located at kilometer 17 on the south bank of the Rimac, occupies an area one km. long by ½ km. wide. It is composed of 3 large structures which form a triangle. The architecture is the usual late period mixture of good stone, mold-made adobes, and tapia. There is an extensive living area in the periphery of the main buildings. The architecture of the living quarters is the same as that of the main buildings, which do not appear to be of the ceremonial type. Areas between the living quarters are for the most part occupied by looted graves. Ceramics consist of a mixture of what Strong named "Inca-associated" and Cuzco Inca. Some utilitarian ware might be identified as "Huancho," a homogeneous pre-Incaic culture manifestation in the middle and upper Rimac. In Schaedel's terminology the site would be classified as "provincial elite," the largest of that category in the Rimac. It probably corresponds to Huancho-Huallas on Romero's map and either Lomo Largo, Vitarte, or Barbadillo on Mead's. A shell mound site, located east of kilometer 71 on the Panamerican highway south from Lima, was reconnoitered and briefly tested by Stumer and Frederic Engel. It consists of 15 mounds. Ceramics occur only in the first 50 cm.; agricultural remains continue below this limit. Engel plans to excavate the mounds systematically later this year.

CERRO DE ORO, a site reported by Kroeber in the Cañete Valley, yielded additional information which Stumer believes will amplify Kroeber's observations significantly. The great walled cemeteries are intrusive into the architecture of a walled town which crowns the hill. The ceramics pertaining to the burials are Inca-influenced and late Cañete Purple-on-white. The area of the walled town includes refuse heaps, graveyards, ovens, and formal edifices. The ceramics in this area range from Tiahuanacoid 1 to Late Cañete. One of the major late period sites on the Central Coast, Cerro de Oro may well have been the capital of the Huarco Confederacy.

News from the Cuzco area is derived from reports in the local press. John Rowe is reported to have found and to be excavating a site with abundant cultural remains of the Chanapata period. Chavez Ballon, professor of archaeology of the University of Cuzco, is reported to have found a vertical puma head tenon of stone in the vicinity of Llallagua near Puno. From the drawing published in the newspaper, the sculpture is almost identical to one published as part of the Pucara

stone sculpture by Valcarcel. Two hilltop fortifications in the vicinity are described in the same news report as Incaic and "Kolla," respectively.

BOLIVIA. The following material was abstracted from a recent Bolivian publication which is virtually impossible to obtain, namely, *Gaceta Campesina*, Organo Oficial del Ministerio de Asuntos Campesinos, Año II, No. 2, April 1953. "Estudio Arqueologico de las Ruinas de Kalaque" by Gregorio Cordero is a report of preliminary archaeological investigations on the peninsula of Kalaque. The following sites are described: *Turini Pata Huyo*, a hill site composed of a number of stone structures in a north-south alignment. In the center of these there is a patio or enclosure surrounded by pirca walls which measures 23 by 24 m. In the exact center of this enclosure is a pit covered by large stones. Near this are 2 monolithic blocks which are worked but not sculptured. The remains of 2 "towers" in the central part of the east wall flank what was apparently the entrance. Between them is a stairway of stones 9 m. wide. The surface of the site is littered with Decadent Tiahuanaco sherds. A pit made in one corner of the building revealed remains of a stone-walled canal at 90 cm. depth. In the same excavation a globular vase of white-black-gray on reddish brown was found. In the vicinity subterranean dwellings were noted which communicate with each other via passageways. The dwellings measure 2 by 2½ m. A ditch 3½ m. square was excavated 50 m. from the enclosure. It was composed of 7 compartments, each 80 cm. high. From these human bones and plainware fragments were secured. An excavation of a circular, stone-lined tomb some 200 m. to the north revealed a skeleton with 2 small copper tupus. *Taja Lamaya Pata* or *Coituni Huyo*, apparently a village composed of a longitudinal alignment of dwellings. A central area of 50 m. was studied. Fourteen dwelling units, each measuring 2.60 m. square, were plotted. Excavations within these structures yielded plainware pottery only. An accidental find of a multiple burial contained 15 crania. Cordero considers the site "Chullpa" or "pre-incaico." *Chuani Huyo*, Classic Tiahuanaco sherds occur along with "pre-incaico" and Incaic. Teachers from the school of Wichi Wichi, 2 km. away, are reported to have excavated some fine examples of Classic Tiahuanaco pottery along with Incaic metal work.

Argentina (Associated Press dispatch). On the summit of the volcano Antofalla, near the Argentine-Chilean frontier, at 6300 m. altitude a pre-Columbian "city" was discovered by an expedition from the Natural History Museum of Salta. The expedition was headed by Amadeo Sirolli, museum director. The remains of 47 groups of houses of 3 to 4 rooms were found, with cultivated fields and irrigation canals. A mound with stairs was considered to be an altar. "Objects found in the tombs have the characteristics of the Aymara culture," the members of the expedition added.

Chile. The Uhle collection from the Tiahuanacoid cemeteries at Pisagua has been located in the Museo Historico in Santiago and an inventory will be incorporated in the forthcoming report on Chilean archaeology of the Centro de Estudios Antropologicos.

The Centro de Estudios Antropologicos of the University of Chile is completing its investigation of the major archaeological sites in Santiago and the Central Chilean coast.

LOWLAND SOUTH AMERICA

Archaeological investigations were conducted in the Ecuadorian lowland during September and October of 1954 by Clifford Evans, Division of Archeology, U.S. National Museum, Betty J. Meggers, and Emilio Estrada of Guayaquil. Much of this area is being opened for agriculture which, together with new roads, is destroying many sites. Estrada's previous extensive survey work in the Provinces of Guayas, Los Rios, and Manabi had located numerous habitation and burial sites. Several of the former, with refuse accumulations up to 4 m. in depth, were excavated stratigraphically. Preliminary examination of the unwashed sherds suggests that it will be possible to establish the cultural sequence in this part of Ecuador and to determine the relationships between, and the geographical distribution of, the various cultures.

Clarification of some of the connections with cultures in Peru, Colombia, and Mesoamerica should also result from a better knowledge of the relative temporal position of the Ecuadorian coastal styles.

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